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LABORATORY ANNUAL..(U) ARMY MEDICAL BIOENGINEERING
RESEARCH AND DEVELOPMENT LAB FORT.. J N ALBERTSON
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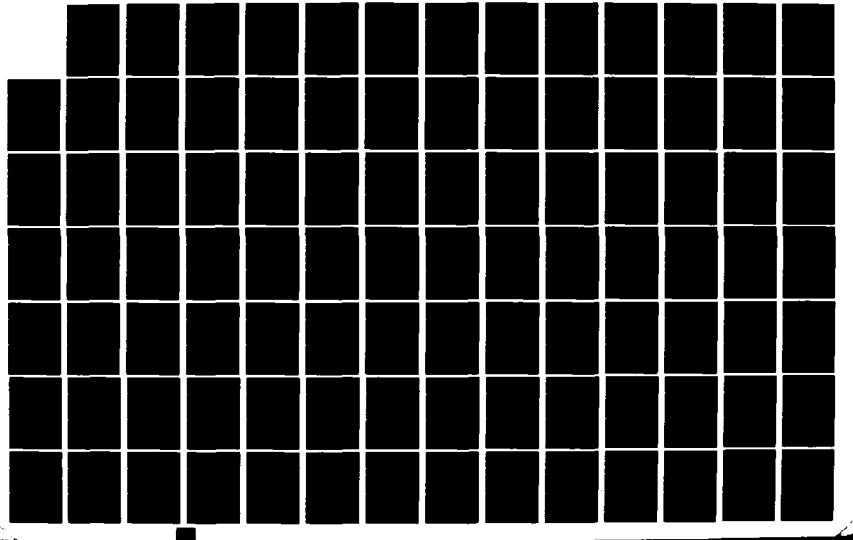

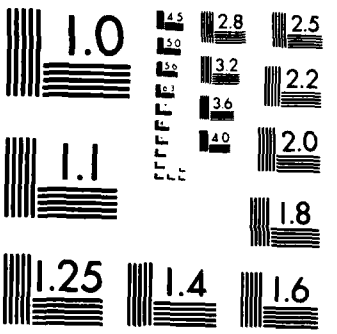

AD A

US ARMY MEDICAL BIOENGINEERING RESEARCH AND DEVELOPMENT LABORATORY

Annual Report for the Period 1 October 1980 - 30 September 1981

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER MEDDH-288 (R1)	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) US Army Medical Bioengineering Research and Development Laboratory Annual Progress Report FY1981		5. TYPE OF REPORT & PERIOD COVERED Annual Progress Report 1 Oct 1980-30 Sep 1981 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) JOHN N. ALBERTSON, Jr., COL, MSC		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Medical Bioengineering Research and Development Laboratory Fort Detrick, Frederick, MD 21701		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS See Reverse
11. CONTROLLING OFFICE NAME AND ADDRESS US Army Medical Research and Development Command Fort Detrick, Frederick, MD 21701		12. REPORT DATE 1 October 1981 13. NUMBER OF PAGES 148
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Aquatic Toxicology, Casualty Evacuation, Chemical Decontamination, Chemical Warfare Defense, Combat Medical Materiel, Environmental Fate, Field Dental Equipment, Field Water Supplies, Field X-ray Equipment, Hazardous/Toxic Waste Disposal, Health Standards for Military Pollutants, Occupational Health Related to Chemicals, Pest Management, Pesticide Dispersal, Pesticide Disposal, Wastewater Treatment.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Annual Progress Report, Fiscal Year 1981, summarizes research performed by the US Army Medical Bioengineering Research and Development Laboratory in projects authorized by The Surgeon General, US Army, and the Commander, US Army Medical Research and Development Command: and supported by RDTE funds from the US Army Medical Research and Development Command.

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UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Block 10:

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61101A 3A161101A91C.00.068
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62734A 3M162734A875.BA.227

64717A 3S464717D832.AA.003
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64717A 3S464717D832.BB.015
64717A 3S464717D832.CA.017
64717A 3S464717D832.BA.041
64717A 3S464717D832.BA.042
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62720A 3E162720A835.AA.150
62720A 3E162720A835.AA.152

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62772A 3S162772A874.BA.228
62772A 3S162772A874.BA.232
62772A 3S162772A874.BA.235
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PREFACE

The United States Army Medical Bioengineering Research and Development Laboratory (USAMBRDL), a subordinate unit of the United States Army Medical Research and Development Command (USAMRDC), is located at Fort Detrick, Maryland, at the apex of a triangle between Baltimore and Washington on the outskirts of the City of Frederick.

The unit was established on 1 September 1972 by the merger of the US Army Medical Equipment Research and Development Laboratory (USAMERDL) and the US Army Medical Biomechanical Research Laboratory (USAMBRL). On 1 July 1973, USAMBRDL was directed to absorb the resources and mission of the US Army Medical Environmental Engineering Research Unit (USAMEERU), located at Aberdeen Proving Ground (Edgewood Arsenal), Maryland. This action was completed on 30 October 1973, with the simultaneous discontinuation of USAMEERU and the formation of the Environmental Protection Research Division within USAMBRDL. By September 1974, all of the division's personnel and materiel resources had been relocated to Fort Detrick.

Organized in September 1921 at Carlisle Barracks, Pennsylvania, the original USAMERDL was established to provide engineering development of medical items required for field use of the Army. During the years 1946-1957 the laboratory was under the command of the former Army-Navy Medical Procurement Office, and in 1948 was moved to Fort Totten, New York. Subsequently, under the technical supervision of the Armed Services Medical Materiel Coordination Committee, it came under complete control of the Army in June 1962 as a subordinate element of The Surgeon General's Research and Development Command. USAMERDL through the years continued to develop and improve upon medical materiel peculair to the needs of the Armed Forces.

Established in 1946 by the Army Medical Service, the former USAMBRL was originally known as the Army Hand Laboratory, and later changed to Army Prosthetics Research Laboratory (APRL). During the early years, APRL research involved the development of new prosthetic devices. Around 1955, the research effort became more diversified and included the development of new surgical repair materials. With the expansion of the mission to include internal body prosthetics, the name of the laboratory was changed in 1963 to US Army Biomechanical Research Laboratory.

The former USAMEERU was activated on 1 July 1972. USAMEERU represented a major Army "first" in that its mission was to conduct continuing environmental health engineering research in support of The Surgeon General's responsibilities in air and water pollution control and abatement.

Today, USAMBRDL's facilities are housed in five separate buildings on Fort Detrick with total floor space exceeding 100,000 square feet.

With the exception that USAMERDL no longer performs research in the area of prosthetic devices or surgical materials and there is much greater emphasis on pest management research, current missions can be traced back to the original three laboratories. Not surprisingly, these missions reflect a highly interdisciplinary staff and the need for a responsive and flexible management structure. Current missions are as follows:

Conducts in-house and extramural research, development and acquisition of medical, dental, and pest management materiel for use in non-contaminated as well as in chemically contaminated environment on a continuing basis for the Army, and on an as required basis for the Navy and Air Force. This includes providing input to the medical materiel developer's portion of the Life Cycle System Management Model, and the Product Improvement Program, coordinating an integrated pest management program, constructing initial pilot prototypes and test models, and producing limited quantities of medical materiel to support urgent military requirements.

Conducts comprehensive basic and applied research and management of extramural research in support of The Surgeon General's responsibilities in environmental quality protection to include air, land, and water pollution control and disposal of hazardous/toxic wastes and pesticides; and The Surgeon General's responsibilities in occupational health protection associated with Army personnel exposures to chemical hazards of military systems and operations, and military personnel exposures to chemical, biological and radiological contaminants associated with field water supply and sanitation.

To accomplish these missions, the laboratory is authorized 138 positions consisting of 20 officers, one warrant officer, 15 enlisted personnel, 93 general schedule civilians and nine wage grade civilians. In addition, the personnel complement is augmented through various cooperative training programs with universities, colleges and other government agencies. Professional disciplines represented in the organization include:

Aquatic Biology
Biostatistics
Biomedical Maintenance Technology
Chemistry
- Analytical
- Biochemistry
- Polymer

Computer Sciences
Engineering Crafts and Drafting
Entomology
Environmental Microbiology
Engineering
- Biomedical
- Chemical
- Electrical
- Electronics
- Mechanical
- Sanitary/Environmental

Graphic and Photographic Arts
Operating Room Nursing
Pharmacology
Toxicology

TABLE OF CONTENTS

IN-HOUSE LABORATORY INDEPENDENT RESEARCH

...CHLORIDE ;(U) OPTIMIZATION;(U) LITERATURE
...SUNLIGHT ;(U) SOLAR CELLS ;

	DA0G3111	01 OCT 81	REPORT CONTROL SYMBOL FHP24C
U		NL	X CONTRACTOR ACCESS YES ☐ NO
			A WORK UNIT
	PROGRAM ELEMENT NUMBER	WORK UNIT NUMBER	
	00	066	

...WORK CHEM

	00		C IN-HOUSE
	RESOURCES ESTIMATE	A PROFESSIONAL MAN YRS	B FUNDS (In Thousands)
	FISCAL YEAR 1981	0.5	$ 7
	1982	0.2	$ 10

407838	2406	U	
	48		

PERFORMING ORGANIZATION 407838 2406

NAME MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS FT DETRICK MD 21701

PRINCIPAL INVESTIGATOR (If this person is a U.S. Army employee)

NAME HOKE, S H

TELEPHONE 3016632036

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME

NAME

...SOLAR CELL ... PHOTOVOLTAIC;(U) SILVER CHLORIDE ;

(Project Start and End Dates with Security Classification Code)

...TO DETERMINE WHETHER OR NOT A PHOTOCELL CAN BE CONSTRUCTED USING SILVER ... TO PRODUCE ELECTRICITY FROM LIGHT. THIS PHOTOVOLTAIC CELL COULD PROVIDE A SILENT ... POWER TO OPERATE ELECTRONIC MONITORING INSTRUMENTATION AT REMOTE MILITARY SITES.

... A LITERATURE SEARCH WILL BE CONDUCTED. THEN A PHOTOCELL WILL BE ... CONSTRUCTED. PARAMETERS WILL BE VARIED IN ORDER TO DETERMINE THE OPTIMUM ... FOR CONVERTING SUNLIGHT TO ELECTRICITY.

... A LITERATURE SEARCH CONDUCTED DURING FY 81 INDICATED NO RESEARCH ... THIS TYPE OF PHOTOCELL. MATERIALS AND CHEMICALS HAVE BEEN ORDERED AND ASSEMBLED. ... HAS BEEN DESIGNED. THIS CELL HAS DEMONSTRATED THAT ELECTRICITY CAN BE ... FROM SUNLIGHT USING AGCl. THE CELL NEEDS TO BE MODIFIED, HOWEVER, IN ORDER TO ... ITS EFFICIENCY.

PROCESSING DATE: 28 FEB 82

...ASSIFIED

[illegible]

[illegible] is to design and evaluate a photo- [illegible] silicon chlorides.

[illegible] technologies. [illegible] electrical power to [illegible] to both the military and

[illegible] conducted initially. The photocell will then [illegible] cell will be evaluated by varying [illegible] converting sunlight into electric-

[illegible] indicates no research activity in this area. [illegible] A preliminary cell has been designed [illegible] potential is observed when this cell is [illegible] lamp.

[illegible] This type of cell could provide power for water purification systems and pollution control monitoring instrumentation in remote locations. [illegible] would not pollute the environment as many other energy sources currently

(U) MALATHION ;(U)
(U) DYES ;(U) CHLORDANE ;(U)
(U) SILICA GEL

REPORT CONTROL SYMBOL
FHP24C

OCT 81

A. WORK UNIT

NL

WORK UNIT NUMBER

DET

(U) SPECIFIC ADSORBENT SURFACES

012100 ORG CHEM

DA

C IN-HOUSE

FISCAL YEAR	PROFESSIONAL MAN YRS	FUNDS
1981	0.4	$ 10
1982	0.3	$ 19

407838 2406

MORDC MEDICAL BIOENGINEERING R&D LAB

FT DETRICK MD 21701

KULKARNI, R K
3016632036

(U) ADSORPTION ;(U) PESTICIDES ;(U) DYES ;(U) MECHANISM

OBJECTIVE: HYDROPHILIC SILICA GELS CAN BE MADE TO FORM SPECIFIC ADSORBENT SURFACES FOR ORGANIC MOLECULES LIKE DYE STUFFS. THE OBJECTIVE OF THE PRESENT INVESTIGATION IS TO TEST THE HYPOTHESIS AND PREPARE HIGH POTENCY ADSORBENT SURFACES ON SILICA GEL FOR MILITARY RELEVANT PESTICIDES AND OTHER MILITARY RELEVANT OR UNIQUE POLLUTANTS IN WASTEWATER. THE BASIC CONCEPT OF PRODUCING A HIGHLY EFFICIENT SPECIFIC ADSORBENT, WITH CAPABILITY OF REGENERATION, IS VALUABLE IN RESEARCH OF WASTEWATER TREATMENT FOR REMOVAL OF TOXIC CONTAMINANTS OR CARCINOGENS FOUND IN MILITARY WASTE STREAMS FROM INSTALLATION PEST MANAGEMENT OPERATIONS OR MUNITIONS-PRODUCTION FACILITIES.

APPROACH: USE SILANE TO PREPARE SPECIFIC SILICA GEL ADSORBENTS FOR METHYL ORANGE, ETHYL ORANGE, 4-NITROPHENYL METHYL SULFONE, MALATHION, AND CHLORDANE AND EVALUATE THEIR PROPERTIES AS ADSORBENTS FOR THE SPECIFIC SUBSTANCES.

PROGRESS: SHAPE AND SIZE OF THE ADSORPTION ISOTHERMS CLEARLY SHOWED THAT SILICA GELS DO FORM DEFINITE SPECIFIC SURFACES FOR THE COMPOUNDS MENTIONED IN 24 ABOVE. IT IS PROPOSED TO STUDY THE SPECIFIC ADSORPTION PROPERTY OF THE SILICA GELS BY FURTHER MODIFICATIONS OF THE SPECIFIC SURFACES BY THE SUITABLE ADJUSTMENT OF THE HYDROPHILICITY, POROSITY, AND PORE SIZE OF THE GELS BY USING THE TECHNIQUES OF PARTIAL PHASE-REVERSION IN THE COURSE OF FORMATION OF THE GELS BY POLYMERIZATION. THIS WORK WILL BE CONTINUED FOR FY 82.

PROCESSING DATE: 28 FEB 82

DETAIL SHEET

TITLE: Formation and Evaluation of Specific Adsorbent Surfaces

FUNDING HISTORY: PY - 12; CY - 10; BY - 19K

PROBLEM DEFINITION: This study involves the preparation of specific adsorbent surfaces on silica gel under acid pH and aluminum hydroxide in alkaline pH for ethyl orange or methyl orange, and evaluation through the study of adsorption isotherms. This study may lead to the study of the cross-linked heme and block copolymers for dyes and pesticides.

IMPORTANCE: This study is important in elucidation of the behavior of Si and Al gels as template-like specific adsorbents, for any organic molecules. This behavior, if proved to be true, may lead to the preparation of high potency adsorbents for the pollutants in wastewater. Such adsorbents may facilitate the treatment of Army unique or relevant wastewater for removal of pesticides and other toxic substances.

APPROACH: The preparation and evaluation of silica gels in the presence of methyl or ethyl orange, and also, p-chlorophenyl methyl sulfone, in order to reproduce and establish the data available in the literature. Then the same technique may be established for other pesticides and pollutants. The silica gels can be modified by aluminum hydroxide or chlorosilicon compounds, to suit the adsorbent surfaces to the structure of the pollutants.

ACHIEVEMENTS: A protocol was prepared for the experimental work needed to confirm the specific results on silica gel adsorbents. A survey of the literature on the preparation of synthetic copolymers for specific adsorption was carried out. Five different silica gel adsorbents for ethyl orange and p-chlorophenyl methyl sulfone have been prepared. The study of their adsorption isotherms will be continued in FY82.

RELATIONSHIP TO CORE PROGRAM: The basic concept of producing a highly efficient specific adsorbent with capability of regeneration, is useful in the research program for removal of toxic contaminants that have been found in waste streams and ground water at Army installations.

UNCLASSIFIED

(U) ADSORPTION CARTRIDGES ;(U) CHEMICAL AGENTS ;(U) DETECTION ;(U) G-AGENTS ;(U) GAS CHROMATOGRAPHY ;(U) LIMITATIONS ;(U) NERVE AGENTS;(U) ORGANIC PHOSPHORUS COMPOUNDS ;(U) PESTICIDES ;(U) SIMULATION ;(U) SOLUTIONS(MIXTURES ;(U)

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

REPORT CONTROL SYMBOL: FHP24C

19 SEP 81	B CHANGE	U	U	DA0J7061	01 OCT 81	NL	CONTROL USE ☒ ACCESS NO ☐	LEVEL OF SUM: A WORK UNIT
PROGRAM ELEMENT NUMBER: 61101A	PROJECT NUMBER: 3A161101A91C	TASK AREA NUMBER: 00	WORK UNIT NUMBER: 068					

(U) FEASIBILITY OF USING ADSORPTION CARTRIDGES TO TRAP TRACES OF AGENT SIMULANTS FROM WATER

002700 PHYS CHEM		002300 BIOCHEMI	
MAR 82	SEP 82	DA	C. IN-HOUSE

	FISCAL YEAR	(U) ESTIMATE / TEST PLAN	(U) PROFESSIONAL MAN YEARS	(U) CUMULATIVE $ THOUSANDS
	1981	0.2	$ 15
	1982	0 1	$ 10

PERFORMING ORGANIZATION	407838 2406
NAME	MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS	FT DETRICK MD 21701
PRINCIPAL INVESTIGATOR (Individual responsible for technical performance)	
NAME	GENSLER, C O
TELEPHONE	3016632014
SOCIAL SECURITY ACCOUNT NUMBER	
ASSOCIATE INVESTIGATORS	
NAME	WADE, C W R
NAME	ROSENCRANCE, A B

21A	B	C	D	E

(U) WATER ;(U) G-AGENTS ;(U) ADSORPTION CARTRIDES ;(U) NERVE AGENTS;(U) DETECTION LIMITS

OBJECTIVE:(U) THE XM272 WATER TEST KIT, USED BY THE ARMY, WAS DEVELOPED TO DETECT CHEMICAL NERVE AGENTS IN WATER AT A LEVEL OF 0.02 TO 0.005 MG/L. PRESENTLY, DETECTION AT SUCH LOW LEVELS CANNOT BE ACHIEVED. ADSORPTION CARTRIDGES COULD BE USED TO CONCENTRATE SUCH AGENTS FROM WATER IN ORDER TO DETECT LOW-LEVEL CONCENTRATIONS OF AGENTS WITH THE XM272 TEST KIT. WE WILL DETERMINE THE FEASIBILITY OF THIS APPROACH.

APPROACH (U) AQUEOUS SOLUTIONS OF G-AGENTS (5 AND 20 PPB) WILL BE PASSED THROUGH SEP PAK C SUB 18 ABSORPTION CARTRIDGES (A PRODUCT OF WATERS ASSOCIATES, INC.). THE ABSORBED AGENTS WILL BE ELUTED FROM THE CARTRIDGES WITH METHANOL AND ONTO AN ACETYLCHOLINESTERASE TEST TICKET. ENZYME INHIBITION WILL BE DETERMINED.

PROGRESS (U) 8107 8109 DURING FY81 SEP PAK C SUB 18 CARTRIDGES WERE SHOWN TO EFFECTIVELY ADSORB SEVERAL ORGANOPHOSPHORUS PESTICIDES FROM WATER AND RELEASE THEM UPON ELUTION WITH A SMALL VOLUME OF METHANOL. WE EXPECT G-AGENTS TO BEHAVE IN A SIMILAR WAY.

PROCESSING DATE: 30 NOV 81

DETAIL SHEET

TITLE: Feasibility of using C_{18} cartridges to Trap Traces of G-Agent [illegible]

FUNDING: [illegible]

OBJECTIVE: The objective of this work was to determine how well SEP PAC C_{18} adsorbs [illegible] pesticides from water when the [illegible] ppb and how efficiently they may be [illegible] with a small volume of methanol.

[illegible] to determine low level concentrations [illegible] The XM272 water test kit was developed by the Army to detect chemical agents in water. At present, it is required that nerve [illegible] The XM272 test kit is not capable of [illegible] low level. One approach to solving this problem [illegible] agents to levels detectable by the available XM272 kit.

APPROACH: A commercial adsorbent cartridge is available from Waters Associates, Inc., Milford, MA. This device, called SEP PAK C_{18}, is a small polyethylene cartridge containing [illegible] silica bonded with octadecylsilane. This cartridge fits onto a luer-lock syringe and a water sample containing pesticides at the ppB level is pushed through the SEP PAK cartridge. Elution of the SEP PAK with a small volume (1 ml) of methanol will release the absorbed pesticide.

ACHIEVEMENTS: SEP PAK C_{18} cartridges effectively remove diazinon, ronnel, dursban, parathion, and [illegible] (2, 10 and 50 ppB) from dilute aqueous solution. Elution of such a cartridge with a small volume of methanol gives an excellent recovery of the pesticide in a more concentrated state. Since organophosphorus pesticides and nerve agents share in some chemical similarities, it should be possible to incorporate a simple adsorption device into the XM272 kit in order to improve its sensitivity to water containing nerve agents at levels below 0.02 mg/L.

RELATIONSHIP TO COFE PROGRAM: USAMBRDL has just recently entered into the area of chemical defense. This [illegible] offered an opportunity to respond rapidly to an immediate problem in this area.

INTENTIONS FOR FY82: The SEP PAK C_{18} cartridge concentration technique will be applied to dilute solutions containing nerve agents at 0.02 to 0.005 ppM level during FY82. One hundred ml of such a solution will be put through an adsorption cartridge. The absorbed nerve agent will then be eluted from the cartridge with 1 ml of methanol. The eluate will go directly onto an acetylcholinesterase test ticket to determine the presence of an enzyme inhibitor.

...PATHOGENIC MATERIALS
...INSECT CONTROL ;

...RESEARCH AND ... | ...FEDERAL CONTROL SYMBOL: FHK53E
...82 AUG 31 | ...A WORK UNIT NUMBER

...DEVELOPMENT OF SYSTEM FOR LABORATORY EVALUATION OF ... BY IMPORTANT ARTHROPODS

...IN-HOUSE

...	$ 14
...	$ 0

407838 2406

...WRAIR MEDICAL BIOENGINEERING R&D LAB
... FREDERICK MD 21701

HAMES, C M
...

MEMBREE, S C
3016687237

VAN ESSEN, F
NELSON, J M

...; PATHOBIOLOGY (U); INSECT PATHOLOGY (U); DISEASE VECTORS (U); ARTHROPOD CONTROL; BIOLOGICAL CONTROL (U); INTEGRATED CONTROL;

OBJECTIVE (U): TO DEVELOP A SYSTEM FOR LABORATORY EVALUATION OF BIOLOGICAL CONTROL POTENTIAL OF ARTHROPOD PATHOGENS FOR ARTHROPODS OF MEDICAL IMPORTANCE.

APPROACH (U): TWO PROTOZOAN MOSQUITO PATHOGENS OF THAI AEDES AEGYPTI WILL BE USED AS MODELS TO DEVELOP AND TEST PROTOCOLS FOR THE PRELIMINARY EVALUATION OF THE EFFICIENCY, SAFETY, MASS PRODUCTION POTENTIAL, STORAGE CHARACTERISTICS, AND RESISTANCE TO DENATURATION IN THE ENVIRONMENT OF CANDIDATE BIOLOGICAL CONTROL AGENTS FOR MOSQUITOES.

PROGRESS (U): 8210 ... A PRELIMINARY ASSESSMENT WAS MADE OF THE MICROBIAL CONTROL POTENTIAL OF A HELICOSPORIDIUM SP. (PROTOZOA HELICOSPORIDA) FROM AEDES AEGYPTI AND CULEX QUINQUEFASCIATUS IN THAILAND. AE. AEGYPTI WAS USED AS AN EXPERIMENTAL HOST IN WHICH TO DETERMINE DOSE-MORTALITY EFFICIENCY OF THE PATHOGEN, ITS STORAGE PROPERTIES AND ITS SUSCEPTIBILITY TO DEGRADATION BY VARIOUS STRESSORS LIKELY TO BE ENCOUNTERED IN THE AQUATIC ENVIRONMENT, SUCH AS HEAT, PH, SALINITY, DETERGENTS, AND ULTRAVIOLET LIGHT WERE ANALYZED. THE INFECTIVITY OF THE HELICOSPORIDIAN SPORE TO THE FALL ARMY WORM, SPODOPTERA FRUGIPERDA BY INJECTION AND REDUCED INFECTIVITY RESULTING SPORES WAS DEMONSTRATED. THE INFECTIVITY OF THE PATHOGEN FOR ANOPHELES BALABACENSIS, AN MACULATUS AE. LENIORHYNCHUS AND TOXORHYNCHITES SPLENDENS WAS QUANTIFIED. IT WAS CONCLUDED THAT THIS AGENT WAS UNLIKELY TO BE USEFUL AS A PRACTICAL, COST-EFFECTIVE MICROBIAL CONTROL AGENT UNTIL VARIOUS TECHNOLOGICAL ADVANCES ARE MADE.

PROCESSING DATE: 14 JUL 82

...143(M)

REPORT NO. ...

TITLE: [illegible] Biological [illegible] ...ically Important [illegible]

[illegible]

[illegible] and forestry for [illegible] pathogens [illegible] commercially [illegible] assess their [illegible] ded to [illegible] and [illegible]

IMPORTANCE: [illegible] by conventional [illegible] for [illegible] economical, efficient [illegible]

APPROACH: [illegible] being used as [illegible] of safety, efficiency, [illegible] resistance to [illegible]

ACCOMPLISHMENTS: [illegible] the microbial control potential [illegible] from Aedes aegypti and Culex [illegible] used as an experimental [illegible] of the pathogen. Its [illegible] by various [illegible] such as heat, [illegible] analyzed. The [illegible] the fall armyworm, Spodoptera frugiperda, [illegible] of the resulting spores. The infectivity [illegible], An. maculatus, Ae. taeniorhynchus [illegible] was quantified. It was concluded that the agent [illegible], cost-effective microbial control agent [illegible] are made.

RELATIONSHIP [illegible] one of the triad of control methods [illegible] program. Project is providing [illegible] system against mosquitoes.

MANUSCRIPTS: [illegible] New Microsporidian [illegible] Stephen C., and Jeffrey [illegible]

Evaluation of the M[illegible] ...ium sp. [illegible] ...atus from Thailand, [illegible]

TEMS, (U)
INSIS

RESEARCH

HK53E

WORK UNIT

ON

IN HOUSE

$ 1
$ 0

407838 2406

ENGINEERING R&D LAB

HAMES

21A 8

INVERTEBRATE PATHOLOGY (U)

BIOLOGICAL CONTR

OBJECTIVE (U) TO ASSESS THE [illegible] CONTROL AGENT FOR MOSQUITOES, BACILLUS THURINGIENSIS [illegible] FOR SELECTED NON TARGET ORGANISMS REPRESENTING INSECT AND DECAPOD AR[illegible] AND MOLLUSKS.

APPROACH [illegible] INSECT AND DECAPOD ARTHROPODS, FISH, AND MOLLUSCS [illegible] AND IDENTIFIED IN A STUDY AREA WHERE FIELD TRIALS OF BACILLUS THURINGIENSIS [illegible] ARE TO BE CONDUCTED. BIOASSAYS WILL BE CONDUCTED [illegible] TARGET ORGANISMS.

PROGRESS [illegible] COLLECTED FROM A ROADSIDE DITCH ON SEPTEMBER [illegible] BIOCHEM BTI AT A DOSAGE THOUGHT TO PRODUCE [illegible] WERE THEN FED TO THE TWO PREDATOR SPECIES [illegible] EFFECTS WOULD OCCUR. FEEDING BEGAN ON SEPTEMBER [illegible] CRAYFISH WERE FED INFECTED LARVAE. [illegible] WERE NO [illegible] NOT. TWELVE OF THE TREATED CRAYFISH [illegible] APPLICATION OF SPORES FROM A STOCK BTI SOLUTION [illegible] TREATED CRAYFISH DISPLAYED ANY ADVERSE EFFECTS. [illegible] CONTROL ALSO DIED. BY DECEMBER [illegible] NYMPHS HAD DIED. THE TWO NYMPHS THAT HAD [illegible] THE LATTER DEATHS ARE PROBABLY [illegible] LESS THAN IDEAL CONDITIONS [illegible]

... israelensis on Selected

...

PROBLEM DEFINITION ... israelensis (Bti) ... ities, we should ... habitat.

... Agency (EPA) for ... afety to non- ... to the ...

... mollusks will be ... ratory, and ... Bti.

... were exposed to Biochem ... val survivors were ... week) to determine if ... tinued for 10 weeks. ... Fifteen nymphs were ... treated crayfish and five of the ... application of spores from a stock Bti solution. ... of the treated crayfish ... additional treatment and one ... that had died had not received the ... latter deaths were probably due to ... der less than ideal ... those two predators.

RELATIONSHIP TO FUTURE RESEARCH: ... technical base development in the area of ... quality.

... Settling Patterns of Four ... in Large Outdoor ... For publication in Mosquito ...

...ENSIS ;(U) ARTHROPODA ;(U)
DISEASE VECTORS ;(U) ... WORK ;(U) PEST CONTROL;(U)
PATHOLOGY ;(U) ...

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY	30 SEP 81	REPORT CONTROL SYMBOL FHK53E
05 AUG 81 (U) TERMINATION	NL ☒ CONTRACT DATA ☐ ACCESS NO	9. LEVEL OF SUM A. WORK UNIT
		WORK UNIT NUMBER
...		017

(U) COMPARATIVE PATHOLOGY OF BACILLUS THURINGIENSIS VAR. ISRAELENSIS IN AEDES AEGYPTI AND SIMULIUM VITTATUM

		7. PERFORMANCE METHOD C. IN-HOUSE
	8. PROFESSIONAL MAN YRS	9. FUNDS (In Thousands)
1981	0.1	$ 7
1982	0.0	$ 0
	407838	2406

...MEDICAL ... MEDICAL BIOENGINEERING R&D LAB
... DETRICK MD 21701
NAMES (Last, First, Middle Initial)
PEMBREE SC
3016637237
NELSON JH
VAN ESSEN, EW
...(U) PATHOPHYSIOLOGY ;(U) INSECT PATHOLOGY ;(U) DISEASE VECTORS ;(U) ARTHROPODA CONTROL ;(U) INTEGRATED CONTROL;

OBJECTIVE (U) TO DETERMINE THE SITE OF ACTION AND TIME AND DOSE RELATED STRUCTURAL CHANGES CAUSED BY BACILLUS THURINGIENSIS VAR. ISRAELENSIS IN AEDES AEGYPTI AND SIMULIUM VITTATUM AT THE LIGHT MICROSCOPE AND ULTRASTRUCTURAL LEVEL.

APPROACH (U) HISTOPATHOLOGICAL AND ... METHODS WELL ESTABLISHED IN THE STUDY OF BACILLUS THURINGIENSIS IN LEPIDOPTERAN AGRICULTURAL PESTS, WILL BE ADAPTED TO STUDY THE PATHOLOGY OF B. THURINGIENSIS VAR. ISRAELENSIS IN MOSQUITOES AND BLACK FLIES. SITE OF ACTION AND TIME AND DOSE RELATE STRUCTURAL CHANGES ... STUDIED AT THE LIGHT MICROSCOPE AND ULTRASTRUCTURAL LEVEL. INFORMATION ... WILL EXPEDITE THE PROCESS OF REGISTRATION OF THIS IMPORTANT NEW PROSPECTIVE BIOLOGICAL CONTROL AGENT FOR USE AGAINST BLACK FLIES AND MOSQUITOES

PROGRESS (U) 8108 2109 TASK TERMINATED. NO RESULTS REPORTED.

PROCESSING DATE: 30 NOV 81

Title: (U) Comparative ... of Bacillus thuringiensis var. israelensis in Aedes aegypti and ... vittatum

BACKGROUND HISTORY: FY ... 86; FY ... 87

PROBLEM DEFINITION: Bacillus thuringiensis var. israelensis (Bti) is nearing commercial availability as the first economical, effective biological control agent for mosquitoes and blackflies. Definitive studies of its pathology and mode of action have not yet been published.

IMPLICATIONS: Decisions concerning the suitability of this agent for use within the military pest management context should consider the mechanism by which it kills target pests as well as its host bioassay and field studies already underway.

APPROACH: Specimens exposed to Bti for different times will be prepared for histopathological examination by conventional light microscope and ultrastructural methods. Site of action and the development of pathology will be described. These observations should provide approaches to mode of action studies.

ACHIEVEMENTS: Bioassays have related dose to time of death, an essential first step in this project. Specimens were treated, collected at various times after treatment at selected dosages, and preserved for histological examination. Task was terminated due to permanent change of station for principal investigator. No results were obtained.

RELATIONSHIP TO CORE PROGRAM: This project involves development of a technology base in the mode of action of the emerging methodology for using insect pathogens as part of a comprehensive vector control program.

MANUSCRIPT: Dose-Response Studies of a New Species of Per Os and Vertically Transmittable Microsporidian Pathogen of Aedes aegypti from Thailand, by Stephen C. Hembree. For publication in Mosquito News.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC: (U) BIOLOGICAL AGENTS; (U) WORK UNIT; (U) TOXICITY ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

				DAAG0674	01 OCT 81	REPORT CONTROL SYMBOL FHP24C
01 OCT 80	D CHANGE	U	U		NL	X CONTRACTOR ACCESS YES / NO	A. WORK UNIT
TY IN CODES	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
	61101A	3A161101A91C		DC	318		

(U) DEVELOPMENT OF AN AUTOMATED TOXICANT SCREENING TEST BASED ON THE VENTILATORY RESPONSES OF FISH

005900 ENVIR BIOLOGY | 016600 TOXICOLOGY | 012900 PHYSIOLO

OCT 79	SEP 82	DA	C IN-HOUSE

	PRECEDING	a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
	1981	0.2	$ 13
CURRENT	1982	0.2	$ 10

407838	2405

PERFORMING ORGANIZATION

MDRDC MEDICAL BIOENGINEERING R&D LAB

FT DETRICK MD 21701

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SOCIAL SECURITY ACCOUNT NUMBER:

ASSOCIATE INVESTIGATORS

NAME: PACE, RR

GENSLER, G D
3016632014

21A B C D E

(U) FISH ;(U) TOXICANTS ;(U) AUTOMATED ;(U) VENTILATORY ;(U) SCREENING ;

OBJECTIVE: (U) EVALUATION OF A SCREENING TEST DESIGNED TO ESTIMATE THE CHRONIC TOXICITY OF MATERIALS TO FISH BY A TECHNIQUE REQUIRING CONSIDERABLY LESS TIME AND EXPENSE THEN CURRENTLY AVAILABLE METHODS. THE TEST WILL BE USED IN CONJUNCTION WITH A PROGRAM TO ASSESS THE ENVIRONMENTAL HAZARDS ASSOCIATED WITH ARMY-RELEVANT MATERIALS.

APPROACH: (U) A MICROCOMPUTER BASED SYSTEM WILL BE USED TO MONITOR THE VENTILATORY PATTERNS OF 30 BLUEGILL SUNFISH EXPOSED IN GROUPS OF FIVE TO A SERIES OF TOXICANT CONCENTRATIONS. THE LOWEST CONCENTRATION AFFECTING THE VENTILATORY PATTERNS WILL BE COMPARED TO LITERATURE VALUES FOR THE LOWEST CONCENTRATION OF THE SAME TOXICANT AFFECTING BLUEGILL SURVIVAL, GROWTH OR REPRODUCTION DURING LONG-TERM EXPOSURE. THE ABILITY OF THE VENTILATORY MONITORING SYSTEM TO PREDICT CHRONIC TOXIC EFFECT LEVELS WILL THEN BE DETERMINED.

PROGRESS: (U) 8010 - 8109. THE FIRST TOXICANT TEST WAS COMPLETED WITH THE PESTICIDE CHLORDANE. DATA INDICATE THAT SOME TOXICANT-RELATED EFFECTS MAY HAVE BEEN PRESENT AT THE HIGHEST CONCENTRATION TESTED (10 UG/L NOMINAL), BUT A SECOND TEST WILL BE REQUIRED TO CONFIRM THIS DUE TO ANALYTICAL DIFFICULTIES ENCOUNTERED AT THIS LEVEL OF EXPOSURE. VENTILATORY DEPTH DECREASED IN THE CONTROLS WITH TIME, BUT VENTILATORY RATE, GILL PURGE RATE, AND MOVEMENT RATES DID NOT SHOW ANY CONSISTENT TRENDS OVER TIME.

PROCESSING DATE: 30 NOV 81

TITLE: Development of an Automated Toxicant Screening Test Based on the Ventilatory Responses of Fish

FUNDING HISTORY: FY - 4K; FY - 14K; BY - 5K

PROBLEM DEFINITION: Current methods for determining the chronic effects of toxic materials on fish are costly and time consuming. A faster, less expensive screening test to estimate chronic-effect levels would be quite useful. One possible method is based on recent evidence indicating a relationship between the concentrations of a toxicant causing chronic effect on fish growth, reproduction, and survival and the concentration causing abnormal fish ventilatory patterns. The goal of this project is to test this relationship using an automated system for monitoring the ventilatory signals of fish.

IMPORTANCE: The number of materials reaching the environment and posing a potential threat to aquatic organisms is continually increasing. Only a very small number can be tested using full life cycle tests with fish. The development of a sensitive screening test that could be used to estimate chronic toxic effect concentrations would save time, money, and would help set testing priorities so that limited resources could be used for those materials having the greatest potential toxicity.

APPROACH: An automated system has been developed to monitor the ventilatory patterns of 30 bluegill sunfish. Toxicants tested will be those for which the chronic toxicity to bluegills has already been determined. Comparison of these literature values with effect levels found in the ventilatory monitoring tests should indicate the usefulness of the monitoring system as a screening test for chronic toxicity.

ACHIEVEMENTS: The operation of the ventilatory system was evaluated in a test with the organochlorine pesticide chlordane. This test provided necessary information on acclimation time for the fish for each ventilatory parameter (ventilatory rate and depth, gill purge rate, and body movement), the relationship between computer-determined rates and those derived from visual analysis of the ventilatory signals, and on the nature of the bluegill's ventilatory responses to chlordane in water. An invited paper titled "Utilization of Aquatic Organisms for Continuously Monitoring the Toxicity of Industrial Waste Effluents" will be presented at the Twelfth Conference on Environmental Toxicology to be held in Dayton, Ohio in November 1981.

RELATIONSHIP TO CORE PROGRAM: An important part of this Laboratory's responsibility for determining the environmental hazards posed by munitions wastes and other Army-related materials is to estimate the effects of these materials on aquatic organisms.

KEY TERMS ASSIGNED: (U) DETECTION ; (U) PESTICIDES ; (U)
PERFORMANCE ENGINEERING ; (U) LITERATURE SURVEYS ; (U) DYES ; (U) WORK ; (U) WASTE WATER ; (U)
THIN LAYER CHROMATOGRAPHY ; (U) EVALUATION ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY | 04030n58 | 01 OCT 81 | REPORT CONTROL SYMBOL: FHP24C

01 OCT 80	C CHANGE	U	U	NL	CONTRACTOR ACCESS YES ☒ NO ☐ / A WORK UNIT
	61101A	3A161101A91C		321	WORK UNIT NUMBER

(U) DEVELOPMENT OF THIN LAYER CHROMATOGRAPHIC PROCEDURES FOR THE RAPID ANALYSES OF TRACES OF PESTICIDES IN WASTEWATER

012100 ORG CHEM | 012700 PHYS CHEM

021 74	SEP 82	DA	C. IN-HOUSE

		PROFESSIONAL MAN YRS	FUNDS (In Thousands)
FY	1981	0.2	$ 11
FY	1982	0.2	$ 9

CUM TOT	407838	2406
$ 0		

PERFORMING ORGANIZATION: 407838 2406
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NAME: TRYBUS, T

21A B C D E

(U) THIN-LAYER CHROMATOGRAPHY ; (U) PESTICIDES ; (U) ANALYSIS ; (U) WASTEWATER

OBJECTIVE: (U) TO DEVELOP A RAPID FIELD METHOD FOR THE DETECTION OF TRACES OF PESTICIDES IN EFFLUENT FROM CARBON ARMY ADSORPTION/FILTRATION SYSTEMS AND SLUDGE TREATMENT SYSTEMS. THE METHOD MAY BE USED FOR DETECTION OF OTHER POLLUTANTS SUCH AS DYES, MUNITIONS, AND TOXIC SUBSTANCES IN WATER.

APPROACH: (U) RESULTS OF LITERATURE SEARCHES AND NEWLY DEVELOPED METHODS WILL BE COMBINED TO GIVE A THIN-LAYER CHROMATOGRAPHIC PROCEDURE IN WHICH A SINGLE ADSORBENT AND A SOLVENT SYSTEM CAN BE USED TO SEPARATE MIXTURES OF ORGANOPHOSPHORUS AND CARBAMATE PESTICIDES. IN ADDITION, A TECHNIQUE WILL BE DEVELOPED FOR QUANTITATION OF THE RESULTS AT THE TIME OF ANALYSIS.

PROGRESS: (U) 8010 - 8109. A THIN-LAYER CHROMATOGRAPHIC PROCEDURE, USING SILICA GEL AND HEXANE/ACETONE (V/V, 8/3), DEVELOPED IN THIS STUDY HAS BEEN USED AT THE ARMY'S FT. EUSTIS, VA PEST CONTROL FACILITIES TO SEPARATE MIXTURES OF PESTICIDES, INCLUDING BAYGON, DIAZINON, DURSBAN, DIMETHOATE, MALATHION, AND VAPONA. THE PROCEDURE WORKED. THE DETECTION LIMIT OF EACH PESTICIDE WAS FOUND AND COMBINED WITH THE VOLUME SPOTTED TO GIVE CONCENTRATION (PPM) OF THE PESTICIDES IN THE WASTE. MINIATURE CARTRIDGES WERE USED TO LOWER THE DETECTION LIMIT OF EACH SUBSTANCE

PROCESSING DATE: 30 NOV 81

DETAIL SHEET

TITLE: Development of Thin-Layer Chromatographic Procedures for the Rapid Analysis of Traces of Pesticides in Wastewater

FUNDING HISTORY: PY - 13; CY - 11, BY - 9

PROBLEM DEFINITION: To determine if thin-layer chromatography (TLC) can be used in the field as an analytical technique for determining the quality of water produced by the treatment of aqueous pesticide waste at Army pest control facilities.

IMPORTANCE: Federal, State, and DA regulations prohibit the discharge of pesticide waste into sewer systems, into the soil, or into bodies of water unless the pesticide concentrations are below certain preestablished safe levels. To comply with these regulations, as well as reduce the storage of hazardous waste, Army pesticide waste treatment facility operators need a simple reliable system for determining the quality of treated wastewater and selecting the procedure for its disposal.

APPROACH: Chromatographic procedures found in the literature for specific pesticides will be evaluated and adapted to give a developing solvent mixture and adsorbent with potential for separation of mixture of pesticides.

ACHIEVEMENTS: A chromatographic system using thin-layer plates and developing solution of hexane/acetone was used to separate and detect the pesticides, Baygon, Chlordane, Diazinon, Dursban, and Malathion in aqueous waste. The system was used successfully in the field at Ft Eustis, VA, for the above pesticides. However, it also was used to effectively detect two other pesticides, Vapona and dimethoate that were thought to be in the aqueous waste. These seven pesticides represent a small percentage of the pesticides used at DA facilities, hence, a need exists to expand the number of pesticides to include more of the others commonly used by DA.

RELATIONSHIP OF CORE PROGRAM: Evaluation of the effectiveness of treatment programs is usually done in-house on expensive gas chromatographic equipment. This equipment is not suitable for field use. A need exists for a semiqualitative analytical system that can be operated successfully by anyone at a pest control facility. Because this Laboratory is designing and evaluating a treatment facility in its core program in response to a TRADOC request, a simple detection system would greatly facilitate the evaluation and be useful when such facilities are routinely updated.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) DETECTION ;(U) ENTEROVIRUSES ;(U) ELUTION ;(U) WORK (U) WATER ;(U) WASTE WATER ;(U) VIRUSES ;(U) POLIOVIRUSES;(U) FOAMING INHIBITORS;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				DAAG0654	01 OCT 81		REPORT CONTROL SYMBOL FHP24C
01 OCT 80	D. CHANGE	U	U		NL	☒ YES ☐ NO	A. WORK UNIT
10. PE CODES:	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
a. PRIMARY	61101A	3A161101A91C		DO		324	
b. SECONDARY							
c. SECONDARY							

(U) EVALUATION OF THE EFFECT OF AN ANTIFOAM ADDITION TO BEEF EXTRACT ELUENT ON THE RECOVERY OF ENTEROVIRUSES FROM WATER AND WASTEWATER

12. SCIENTIFIC AREAS			
005900 ENVIR BIOLOGY	010100 MICROBIOLOGY	007800 HYG SANI	

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
OCT 79	SEP 82	DA	C. IN-HOUSE

17. RESOURCES ESTIMATE	PREVIOUS FY	A. PROFESSIONAL MAN YRS	B. FUNDS (in Thousands)
FISCAL YEAR	1981	0.1	$ 5
	CURRENT 1982	0.2	$ 6

F. CUM TOT: $ 0

18. PERFORMING ORGANIZATION			
407838	2406	407838	2406

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RESPONSIBLE INDIVIDUAL

NAME: GENSLER, J D

TELEPHONE: 3016632014

GENERAL USE

21A B C D E

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PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)

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SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME

NAME

19. KEYWORDS: (U) VIRUS ;(U) ANTIFOAM ;(U) ENVIRONMENTAL WATERS ;(U) DETECTION ;

20. TECHNICAL OBJECTIVE, APPROACH, AND PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE.(U) TO EVALUATE THE EFFECT OF AN ANTIFOAM ADDITIVE TO BEEF EXTRACT ELUENT ON THE RECOVERY OF ENTEROVIRUSES FROM WATER AND WASTEWATER. THIS WORK WILL PROVIDE IMPROVED CAPABILITY FOR VIRUS ASSAY IN CURRENT MICROBIOLOGICAL EVALUATION OF THE ARMY'S NEW TECHNOLOGY FIELD WATER TREATMENT SYSTEMS (REVERSE OSMOSIS WATER PURIFICATION UNITS).

APPROACH: (U) THE CONCENTRATION FACTOR OF THE BENTONITE SYSTEM WAS INCREASED FIVEFOLD TO STUDY THE MINIMUM DETECTABLE VIRUS LEVEL WITHOUT RECONCENTRATING THE ELUTED VIRUS. PRELIMINARY COMPARISONS WERE MADE BETWEEN THE BENTONITE SYSTEM AND THE NEW MODIFIED-CHARGE FILTER (AMF-CUNO) SYSTEM USING WELL AND POLISHED TAP WATERS. ANTIFOAM B ENHANCING ACTIVITY WAS LOST. AN ANIONIC DETERGENT WAS INVESTIGATED TO DETERMINE IF IT HAD VIRUS ACTIVITY SIMILAR TO THAT OF ANTIFOAM B. A VIRUS CONCENTRATION THEORY WAS PROPOSED BASED ON THESE AND PUBLISHED RESULTS

PROGRESS: (U) 8010 - 8109. THE ADDITION OF 0.18 PERCENT ANTIFOAM B TO BEEF EXTRACT ELUENT SHOWED IMPROVED RECOVERY OF POLIOVIRUS OVER A RANGE OF 11.5 TO 113,300 VIRIONS PER 500 ML AND GAVE LINEAR RECOVERY OF THE VIRUS. THE CONCENTRATION FACTOR WAS ALSO INCREASED FIVEFOLD. THE ANTIFOAM B PREPARATIONS ON HAND LOST THEIR ENHANCING ACTIVITY APPARENTLY DUE TO MICROBIAL CONTAMINATION. AN ANIONIC DETERGENT, DODECYLBENZENESULFONIC ACID SHOWED VIRUS ACTIVITY SIMILAR TO THAT OF ANTIFOAM B USING 5 UL OF THE DETERGENT PER 100 ML ELUENT. A VIRUS CONCENTRATION THEORY WAS DEVELOPED BASED ON THESE AND PUBLISHED RESULTS.

PROCESSING DATE: 31 MAR 82

DD [illegible] 1498M OTIC FORMAT 850 PAGE 26

DETAIL SHEET

TITLE: Evaluation of the Effect of an Antifoam Addition to Beef Extract Eluent on the Recovery of Enteroviruses from Water and Wastewater

FUNDING HISTORY: PY - 11; CY - 5; BY - 6

PROBLEM DEFINITION: The current standard method for virus assay employs filters to trap and concentrate viruses from water environments. Foaming which occurs during elution of these viruses from the filters interferes with the assay procedure.

IMPORTANCE: Improved ability to detect virus in various waters for R&D purposes; secondarily, to reduce the physical and aerosol hazards during elution of these filters.

APPROACH: To test the effects on the recovery of various enteroviruses of adding small amounts of antifoam to the beef extract eluent.

ACHIEVEMENTS: Two blocks of experiments (six samples/block) were completed to test for system variability using poliovirus as a model. This was followed by an optimum antifoam level study using seeded distilled water source and two randomized studies using a common, seeded, tap water source. Quadratic regression analysis of the results indicated that there was a significant effect on the recovery of virus when Antifoam B was added to the eluent. By hand cleaning glassware and filter holders, the recovery of poliovirus has increased from 62.5% to 82.2% using beef extract alone. With the addition of 0.15 - 0.2% Antifoam B (sonically dispersed) to the beef extract eluent, the recovery of virus approached 100% (99.1% $\pm$ 5.3%).

RELATIONSHIP TO CORE PROGRAM: This work will provide improved capability for virus assay in the ongoing evaluation of the Reverse Osmosis Water Processing Unit (ROWPU) that this Laboratory is conducting for USAMERADCOM.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC :(U) BIODETERIORATION ;(U) ENZYMES ;(U) BACTERIA ;(U) GROWTH(GENERAL) ;(U) MICROORGANISMS ;(U) CARBON;(U) SOURCES ;(U) CHEMISTRY

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				DA0G6380	01 OCT 81	REPORT CONTROL SYMBOL FHP24C
01 OCT 80	D CHANGE	U	U		NL	5 LEVEL OF SUM A. WORK UNIT
	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER	
	61101A	3A161101A91C		00	326	

(U) BACTERIOLOGICAL MECHANISM OF 1,3-DINITROBENZENE BIODEGRADATION

007800 HYG SANITATION 012100 ORG CHEM

OCT 80	SEP 82	DA		C. IN-HOUSE

		18 ACCOUNTING EST MATE	a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
	PRIOR YRS			
	FISCAL YEAR 1981		0.2	$ 9
	CURRENT YEAR 1982		0.2	$ 11
	F CUM/TOT	$ 0		

407838	2406	407838	2406

NAME MDRDC MEDICAL BIOENGINEERING R&D LAB	NAME MDRDC MEDICAL BIOENGINEERING R&D LAB
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NAME GENSLER, J D	PRINCIPAL INVESTIGATOR (Number SSAN if U.S. Academic Institution)
TELEPHONE 3016632014	NAME MITCHELL, W R
	TELEPHONE 3016632538
	SOC. SEC. NO. ACCOUNT NUMBER
	ASSOCIATE INVESTIGATORS
	NAME
	NAME

214 B C D E

(U) ; 3-DINITROBENZENE ;(U) BIODEGRADATION ;(U) BACTERIAL ;(U) CHEMISTRY ;

OBJECTIVE: (U) TO INVESTIGATE THE MECHANISM OF 1,3-DINITROBENZENE BIODEGRADATION. THE COMPOUND IS A MAJOR BY-PRODUCT OF MUNITIONS MANUFACTURE, AND, AS SUCH, IS A MAJOR COMPONENT OF ENVIRONMENTAL DISCHARGES FROM MUNITIONS MANUFACTURE AND LOADING AND PROCESSING OPERATIONS.

APPROACH: (U) A MIXED CULTURE GROWING ON 1,3-DINITROBENZENE AS A SOLE CARBON SOURCE WILL BE PLATED, PURIFIED, AND REINOCULTED INTO MEDIUM CONTAINING THE COMPOUND. ORGANISMS GROWING ON THE COMPOUND AS PURE CULTURES, OR IN COMBINATIONS WILL BE IDENTIFIED. MAJOR INTERMEDIATES IN THE PATHWAY LEADING TO BENZENE RING CLEAVAGE WILL BE IDENTIFIED, AS WILL THE OXYGENASE FUNCTIONING TO CLEAVE TO THE RING.

PROGRESS: (U) 8010 - 8109. STUDIES INDICATE THAT 1,3-DINITROBENZENE AGAR WILL NOT SERVE AS A PLATING MEDIUM FOR MICROORGANISMS FROM THE MIXED CULTURE. THREE ORGANISMS HAVE BEEN ISOLATED FROM THE CULTURE ON STANDARD BACTERIOLOGICAL MEDIUM WHICH WILL DEGRADE THE TEST CHEMICAL BUT APPEAR TO LOSE THE CAPABILITY FOLLOWING REPEATED PASSAGE. A SOLID SUPPORT MEDIUM COMPOSED OF PHENOL AND 1,3-DINITROBENZENE HAS BEEN DEVELOPED AND USED TO ISOLATE AN ORGANISM WHICH WILL GROW ON 1,3-DINITROBENZENE FOLLOWING REINOCULATION OF LIQUID MEDIUM. THE ISOLATE IS BEING TESTED FOR ITS STABILITY IN DEGRADING 1,3-DINITROBENZENE FOLLOWING REPEATED PASSAGE ON THE NEW SOLID SUPPORT MEDIUM. SHOULD IT PROVE TO BE STABLE, IT WILL BE IDENTIFIED A

PROCESSING DATE: 28 FEB 82

DD FORM 1498M DTIC FORMAT 850 PAGE 68

DETAIL SHEET

TITLE: (U) Bacteriological Mechanism of 1,3-Dinitrobenzene Biodegradation

FUNDING HISTORY: PY - 0K; CY - 8K; BY - 11K

PROBLEM DEFINITION: The purpose is to identify the microorganism or microorganisms responsible for the biodegradation of 1,3-dinitrobenzene, elucidate microbial interactions should more than one microorganism be responsible, and identify the major pathway for the metabolism of the compound.

IMPORTANCE: The importance of the biodegradation of 1,3-dinitrobenzene as a munitions-related pollutant in general, and specifically as a nitroaromatic chemical compound, lies in understanding the means by which the biodegradation is accomplished. Previous studies indicate that the compound is only partially biodegraded and will not serve as a sole source for microbial growth, but a mixed culture has been developed at USAMBRDL which will grow on and completely degrade the compound. Organisms within this culture must have the capability to modify or remove nitro substituents and to cleave to the modified benzene ring product. An understanding of the organisms and enzyme systems involved could serve as a starting point for the development of strains of microbes capable of degrading a variety of nitro-substituted benzene derivatives.

APPROACH: Mixed culture microorganisms growing in 1,3-dinitrobenzene, as a sole carbon source, will be plated, purified, and reinoculated into medium containing the compound. Organisms growing on the compound as pure cultures, or in known combinations, will be identified by standard bacteriological techniques. Pure cultures of bacteria involved in the biodegradation will be studied to identify the major intermediates leading to cleavage of the benzene ring. In addition, the oxygenase involved in cleavage of the ring will be identified.

ACHIEVEMENTS: Studies indicate that 1,3-dinitrobenzene agar alone will not serve as a plating medium for microorganisms from the mixed culture. Three organisms have been isolated from the culture on standard bacteriological media which will degrade the test chemical but appear to lose the capability following repeated passage. A solid support medium composed of 1,3-dinitrobenzene and yeast extract has been developed and used to isolate organism which will grow on 1,3-dinitrobenzene following reinoculation of liquid medium. The isolate is being tested for its stability in degrading 1,3-dinitrobenzene following repeated passage on the new solid support medium. Should it prove to be stable, biochemiocal studies will be initiated.

RELATIONSHIP TO CORE PROGRAM: The environmental fate of 1,3-dinitrobenzene along with other munitions-related compounds is currently under study at USAMBRDL. Contrary to reports in the literature, a mixed culture has been developed which will grow on and completely degrade the compound. The purpose of this ILIR proposal is to extend and elucidate microbiology of that study.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC :(U) DISINFECTION;(U) OXIDIZERS ;(U) ORGANIC CHEMISTRY ;(U) ORGANIC COMPOUNDS ;(U) SUBSTRATES ;(U) OXIDIZERS ;(U) REACTIVITIES;(U) CHLORINE ;(U) DIOXIDES ;(U) DISINFECTION

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY | DA0G6381 | 30 SEP 81 | REPORT CONTROL SYMBOL FHK53E

01 OCT 80	K COMPLETION	U	U		NL	SPECIFIC DATA CONTRACTOR ACCESS YES ☒ NO ☐	A. WORK UNIT
AGENCY ACCESS	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
	61101A	3A161101B91C		00		327	

(U) MECHANISTIC INVESTIGATION OF DISINFECTION BY CHLORINE DIOXIDE GENERATED IN SITU

007800 HYG SANITATION 012100 ORG CHEM

OCT 80	SEP 81	DA		C. IN-HOUSE
		RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	c. FUNDS (In Thousands)
		PRECEDING FISCAL YEAR 1981	0.1	$ 7
		CURRENT FISCAL YEAR 1982	0.0	$ 0
		CUM TOT		$ 0

	407838	2406	
PERFORMING ORGANIZATION		407838	2406

MDRDC MEDICAL BIOENGINEERING R&D LAB

FT DETRICK MD 21701

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MDRDC MEDICAL BIOENGINEERING R&D LAB

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PRIN. INVESTIGATOR (If other than SSAN, U.S. Academic Institution)
BURROWS, E P
TELEPHONE 3016632036
SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS
NAME
NAME

21A B C D E

(U) CHLORINE DIOXIDE ;(U) DISINFECTION;(U) HALOFORMS ;(U) ORGANIC CHEMISTRY ;

OBJECTIVE:(U) TO CONTRAST FURTHER THE EFFECTS OF CHLORINE DIOXIDE (C1OSUB 2) ALONE AND C1O SUB 2 GENERATED IN SITU ON ORGANIC COMPOUNDS UNDER DISINFECTION CONDITIONS, AND TO OBTAIN EVIDENCE CONCERNING THE NATURE OF A HIGHLY REACTIVE OXIDIZING SPECIES BELIEVED TO DETERMINE THE FATE OF ORGANIC SUBSTRATES DURING IN SITU GENERATIONS.

APPROACH: (U) TWO APPROACHES, ONE DIRECT AND ONE INDIRECT, HAVE BEEN DESIGNED FOR TRAPPING THE INTERMEDIATE OXIDIZING SPECIES AND ARE DESCRIBED IN THE ACCOMPANYING PROPOSAL.

PROGRESS: (U) 8010 - 8109 THE COMPARATIVE STUDIES OVER A RANGE OF PH AND TIME, SHOWED NO SUBSTANTIAL DIFFERENCES IN PRODUCT DISTRIBUTION AT A GIVEN PH AND TIME, BETWEEN C1O SUB 2 ALONE AND C1O SUB 2 GENERATED IN SITU. THUS THE INTERMEDIACY OF C1-C1O SUB 2 IN THE LATTER CASES COULD NOT BE VERIFIED. HOWEVER, A FINDING OF POTENTIALLY GREATER SIGNIFICANCE TO THE USE OF C1O SUB 2 AS AN ALTERNATIVE WATER DISINFECTANT EMERGED FROM THE STUDY: AMIDES, NOT PREVIOUSLY OBSERVED IN C1O SUB 2 OXIDATIONS OF AMINES, WERE IMPORTANT PRODUCTS (ALONG WITH THE EXPECTED PRODUCTS OF OXIDATIVE DEALKYLATION). A PUBLICATION DETAILING THIS FINDING IS IN PREPARATION

PROCESSING DATE: 30 NOV 81

DETAIL SHEET

TITLE: Mechanistic Investigation of Disinfection by Chlorine Dioxide Generated in situ

FUNDING HISTORY: PY - 0K; CY - 7K; BY - 0K

PROBLEM DEFINITION: Acidification of solutions of chlorite salts has long been known to produce ClO_2 and chlorate ion. More than a decade ago, extensive investigation of the kinetics of disproportionation of chlorous acid both in the absence and presence of chloride ion strongly supported a mechanism in which the highly reactive species $Cl\text{-}ClO_2$ is a key intermediate. A comparative product study of the oxidation of p-chlorobenzldimethylamine by ClO_2 alone and by ClO_2 generated in situ showed the reaction took two different courses, and indicated in the latter case the probable involvement of a different oxidizing species which led to the formation of carbon radical intermediates. The proposed study is designed to implicate $Cl\text{-}ClO_2$ as the in situ, carbon radical precursor.

IMPORTANCE: Although it is widely known that use of chlorine dixoide (ClO_2) as an alternative to chlorine in water disinfection does not lead to haloform residues, little information is available as to the identities of and possible health hazards due to a variety of other organic compounds, chlorinated and nonchlorinated, shown to be present in certain ClO_2-treated waters. Reactions of ClO_2 with certain classes of compounds, notably amines, phenols, and olefins have been investigated in some detail, but the studies were not carried out under water treatment conditions. Thus, in order to facilitate assessments of relative safety, further knowledge of the aqueous organic chemistry of ClO_2 is essential.

APPROACH: A simple experiment was designed to trap the intermediate $Cl\text{-}ClO_2$ by reaction with a trichloromethyl radical derived from chloroform to give carbon tetrachloride. When this was unsuccessful, a second approach, involving a comparative product study of the reactions of N,N-dibenzylethylglycinate with ClO_2 alone and with ClO_2 generated in situ, was pursued.

ACHIEVEMENTS: The comparative studies, over a range of pH and time, showed no substantial differences in product distribution at a given pH and time, between ClO_2 alone and ClO_2 generated in situ. Thus, the intermediacy of $Cl\text{-}ClO_2$ in the latter cases could not be verified. However, a finding of potentially greater significance to the use of ClO_2 as an alternative water disinfectant emerged from the study: amides, not previously observed in ClO_2 oxidations of amines, were important products (along with the expected products of oxidative dealkylation). A publication detailing this finding is in preparation.

RELATIONSHIP TO CORE PROGRAM: A major function of the Laboratory has been to conduct environmental fate studies necessary for hazard assessment of the release of a variety of trace organic pollutants to wastewater. Before any hazard assessment of the use of ClO_2 as an alternative disinfectant can be made, the resulting trace organics must be identified. Basic studies of the mechanisms of product formation in model systems will be useful in accurately predicting expected products and in varying conditions to minimize any potentially hazardous ones.

PEST MANAGEMENT SCIENCE BASE

RETRIEVAL TERMS ASSIGNED BY DTIC (U) BIOENGINEERING ;(U) RESEARCH MANAGEMENT ;(U) VECTOR ANALYSIS ;(U) CONTROL ;(U) PEST CONTROL ;(U) RESEARCH MANAGEMENT ;(U) CONTROL ;(U) PEST CONTROL ;(U) BIOENGINEERING ;(U) VECTOR ANALYSIS

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

DA0G5997 | 01 OCT 81 | REPORT CONTROL SYMBOL: FHP24C

08 DEC 80	D CHANGE	U	U		NL	X	A. WORK UNIT
	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER			
	61102A	3M161102BS10	AU	331			

(U) PEST MANAGEMENT SCIENCE BASE

002600 BIOLOGY 002400 BIOENGINEERING

DEC 80	SEP 82	DA	C. IN-HOUSE	
		PRECEDING FY 1981	1.1	$ 87
	F CUM/TOT: $ 0	CURRENT YEAR 1982	2.9	$ 97

407838	2406	407838	2406

MDRDC MEDICAL BIOENGINEERING R&D LAB
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HAMES, W. H., LTC
3016637277

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TELEPHONE 3016637237
SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS
NAME FROMMER, R. L.
NAME

21A B C D E

(U) PEST MANAGEMENT ;(U) INTEGRATED PEST MANAGEMENT ;(U) VECTOR CONTROL ;(U) BIOENGINEERING ;

OBJECTIVE:(U) TO DEVELOP AND MAINTAIN A PEST MANAGEMENT SCIENCE BASE WHICH WILL (A) ENSURE THE APPLIED RESEARCH PROGRAM IS CURRENT IN NEW DEVELOPMENTS IN PEST MANAGEMENT, AND (B) DEVELOP NEW MILITARILY UNIQUE APPROACHES TO INTEGRATED PEST MANAGEMENT.

APPROACH: (U) THROUGH USE OF IN-HOUSE EXPERTISE AND EXTENSIVE INTERRELATIONSHIPS WITH OTHER GOVERNMENT AGENCIES AND THE PRIVATE SECTOR, BASIC RESEARCH WILL BE CONDUCTED IN THE AREA OF INTEGRATED PEST MANAGEMENT. APPROACH WILL BE CENTERED ON MILITARILY UNIQUE ASPECTS OF THE PROGRAM.

PROGRESS: (U) 8012 - 8109. A VARIETY OF VECTOR CONTROL TECHNIQUES WERE IDENTIFIED AS HAVING POTENTIAL FOR MILITARY USE. INCLUDED WERE UTILIZATION OF LIQUID PESTICIDE FORMULATIONS AT LESS THAN CONVERSATIONAL DOSAGES, POSSIBILITIES OF AERIAL DISPERSAL OF BIOLOGICAL CONTROL ENTITIES, EVALUATIONS OF MICROBIAL CONTROL POTENTIAL OF A HELICOSPORIDIUM SP. FOR AEDES AEGYPTI AND CULEX QUINQUEFASCIATUS AND OBSERVATIONS ON THE VERTICAL TRANSMISSION OF A NEW MICROSPORIDIAN PATHOGEN OF AEDES AEGYPTI.

PROCESSING DATE: 06 JAN 82

DD 1498M DTIC FORMAT 850 PAGE 87

DETAIL SHEET

TITLE: (U) Pest Management Science Base

FUNDING HISTORY: PY - 0; CY - 87K; BY - 97K

PROBLEM DEFINITION: The military historically has adopted particular technologies long after they have been proven in the civil sector. This concept has created a lag that has often resulted in the military acquiring outmoded technology. As the technology advances at an even greater rate, the resultant lag becomes greater so that the problem compounds itself.

IMPORTANCE: The military must have state-of-the-art technology in order to perform its mission to support the combat soldier. Attempting to combat vector-borne diseases with outmoded technology will result in inefficiency, wastefulness, and failure to carry out the mission.

APPROACH: Through use of in-house expertise and extensive interrelationships with other government agencies and the private sector, basic research will be conducted in the area of integrated pest management. Approach will be centered on militarily unique aspects of the program.

ACHIEVEMENTS: A variety of vector control techniques were identified as having potential for military use. Included were utilization of liquid pesticide formulations at less than conversational dosages, possibilities of aerial dispersal of biological control entities, evaluations of microbial control potential of a Helicosporidium sp. for Aedes aegypti and Culex quinquefasciatus and observations on the vertical transmission of a new microsporidian pathogen of Aedes aegypti.

RELATIONSHIP TO CORE PROGRAM: This project is a vital part of a comprehensive vector control program, ensuring a steady stream of new, innovative, and often novel approaches to effective control of arthropod vector populations.

COMBAT MEDICAL MATERIEL

RETRIEVAL TERMS ASSIGNED BY DTIC (U) WORK ;(U) MEDICAL PERSONNEL ;(U) LICE ;(U) INSECT CONTROL ;(U) DUST ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

AGENCY ACCESSION: DAOG5861 | 3. DATE OF SUMMARY: 01 OCT 81 | REPORT CONTROL SYMBOL: FHP24C

1a. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECUR'TY	7. REGRADING	8a. DISTRIBUTION INSTR	8c. SPECIFIC DATA: CONTRACTOR ACCESS YES ☒ NO ☐	9. LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL		A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63732A	3S463732D836	AA	002
b. CONTRIB'G				
c. CONTRIB'G				

11. TITLE (Precede with Security Classification Code)

(U) DELOUSING OUTFIT, POWER-DRIVEN

12. SCIENTIFIC AND TECHNOLOGICAL AREAS: 009800 MED HOSP EQ 002400 BIOENGINEERING

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
OCT 80	SEP 85	DA	C. IN-HOUSE

17. CONTRACT/GRANT: a. DATE EFFECTIVE / EXPIRATION; b. NUMBER; c. TYPE; c. AMOUNT; d. NO. OF AMEND.

F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR PRECEDING 1981	0.2	$ 11
FISCAL YEAR CURRENT 1982	0.9	$ 69

19a. PERFORMING ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

19b. RESPONSIBLE INDIVIDUAL

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TELEPHONE: 3016637277

20. GENERAL USE: 21A. B. C. D. E.

20c. PERFORMING ORGANIZATION: 407838 2406

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SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME: THAYER, G.W.

NAME: KARDATZKE, J.T.

22. KEYWORDS: Precede EACH with Security Classification Code: (U) DELOUSER ;(U) DUST ;(U) LICE ;(U) INSECTICIDE DISPERSAL EQUIPMENT ;(U) INSECT CONTROL ;

23. TECHNICAL OBJECTIVE; 24. APPROACH; 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO DEVELOP A NEW REPLACEMENT DELOUSING OUTFIT WHICH IS CAPABLE OF ACCURATELY DISPENSING NEW DELOUSING AGENTS. UNITS WILL BE USED BY MEDICAL AND QUARTERMASTER PERSONNEL FOR CONTROL OF BODY LICE.

APPROACH: (U) USING STANDARD MILITARY AND COMMERCIAL COMPONENTS, REENGINEERING THE MILITARILY UNIQUE DELOUSING OUTFITS. UNITS WILL BE LIGHTER AND LESS BULKY THAN CURRENT ITEMS. DISPERSAL SYSTEM WILL BE VERY ACCURATE AND CAPABLE OF ADJUSTMENT FROM 1 TO 6 GM PER TREATMENT POINT.

PROGRESS: (U) 8010 - 8109. A PRODUCT IMPROVEMENT PROGRAM (PIP) HAS BEEN CONDUCTED ON THE CURRENT DELOUSER. A PROTOTYPE HAND DISPERSAL UNIT WAS DEVELOPED TO REPLACE THE CURRENT ONE WHICH LEAKED AND WAS INCAPABLE OF DELIVERING A REGULATED AMOUNT OF DUST. A PIP UNIT HAS BEEN SHIPPED TO THIS LABORATORY AND WILL BE TESTED TO ASCERTAIN IF THESE MODIFICATIONS ADEQUATELY IMPROVE THE DELOUSER UNIT. SPECIAL EMPHASIS WILL BE GIVEN TO THE APPLICATION RATE TO DETERMINE IF IT CAN BE CONTROLLED.

AVAILABILITY: Contributors upon originators approval

PROCESSING DATE: 13 JAN 82

DD FORM MAY 68 1498M DTIC FORMAT 850 PAGE 64

DETAIL SHEET

TITLE: (U) Delousing Outfit, Power-Driven

FUNDING HISTORY: FY - 0; CY - 11K; BY - 69K

PROBLEM DEFINITION: The current standard Delousing Outfit, Power-Driven, was initially designed during World War II. The delousing outfit does not apply consistent rates of pesticide. This deficiency has been reported as a potential health hazard in conjunction with several field experiments.

IMPORTANCE: Delousing outfits, power driven, are utilized during military operations for control of outbreaks of body lice which precede epidemics of typhus. Delousing outfits will be used to prevent devastating outbreaks of typhus which previously have characterized all armed conflicts in the European theater.

APPROACH: Using standard military and commercial components, the militarily unique delousing outfit will be reengineered. It will be lighter and less bulky, and the guns and nozzles will be specifically designed for uniform dust dispersal.

ACHIEVEMENTS: A Product Improvement Program (PIP) has been conducted on the current delouser. A PIP unit will be tested to ascertain if these modifications adequately improve the existing delousing outfit.

RELATIONSHIP TO CORE PROGRAM: The PIP will update the current Delousing Outfit, Power Driven, available for use in the field.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) CONTROL ;(U) BIOLOGY ;(U) RATES ;(U) PESTICIDES ;(U) MILITARY OPERATIONS ;(U) LABORATORY TESTS ;(U) FORMULATIONS;(U) FIELD TESTS ;(U) DEGRADATION (U) COST EFFECTIVENESS;(U) TACTICAL WARFARE ;(U) RELEASE

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

AGENCY ACCESSION	DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA086223	01 OCT 81	FHP24C

PREVIOUS WORK UNIT	TYPE OF CHANGE	MODIFICATION	WORK SECURITY	REGRADING	DISTRIBUTION INSTR	SPECIFIC DATA: CONTRACTOR ACCESS YES / NO	LEVEL OF SUM
01 OCT 80	D CHANGE	U	U		NL	YES	A. WORK UNIT

PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
63732A	3S463732D836	AA	005

(U) PESTICIDE FORMULATIONS, CONTROLLED RELEASE, ENVIRONMENTALLY COMPATIBLE

PRIMARY TECHNOLOGICAL AREA	SECONDARY TECHNOLOGICAL AREA
005900 ENVIR BIOLOGY	002600 BIOLOGY

START DATE	ESTIMATED COMPLETION DATE	FUNDING AGENCY	PERFORMANCE METHOD
OCT 77	SEP 82	DA	C. IN-HOUSE

GRANT/CONTRACT	DATES (EFF / EXP)	NUMBER	TYPE	AMOUNT	F. CUM TOT	$ 0

RESOURCES ESTIMATE	PROFESSIONAL MAN YRS	FUNDS (in Thousands)
FISCAL YEAR PRECEDING 1981	1.0	$ 90
FISCAL YEAR CURRENT 1982	1.1	$ 102

PERFORMING ORGANIZATION		
407838	2406	

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GENERAL

21A B C D E

PERFORMING ORGANIZATION		
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ASSOCIATE INVESTIGATORS

NAME: ANDERSON, L M

NAME

(U) PESTICIDE FORMULATIONS ;(U) CONTROLLED-RELEASE;(U) PEST MANAGEMENT ;(U) ENVIRONMENTAL COMPATIBILITY ;(U) VECTOR CONTROL

TECHNICAL OBJECTIVE, APPROACH, AND PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO IDENTIFY AND EVALUATE ENVIRONMENTALLY COMPATIBLE CONTROLLED-RELEASE PESTICIDE FORMULATIONS OF MILITARY RELEVANCE FOR USE IN SUPPORT OF TACTICAL OPERATIONS AND FIXED MILITARY INSTALLATION PEST MANAGEMENT/VECTOR CONTROL PROGRAMS.

APPROACH: (U) UTILIZING COMMERCIALLY PREPARED CONTROLLED-RELEASE PESTICIDE FORUMULATIONS AND CARRIERS POTENTIALLY SUITABLE FOR MILITARY USE, QUANTIFY RELEASE RATES AND DEGRADATION RATES IN THE LABORATORY. THOSE FORMULATIONS FOUND TO BE BEST IN LABORATORY TESTS WILL BE EVALUATED IN FIELD TESTS TO VERIFY LABORATORY RESULTS UNDER NATURAL ENVIRONMENTAL CONDITIONS. DETERMINATIONS BOTH IN THE LABORATORY AND IN THE FIELD WILL BE BIOLOGICAL EFFECTIVENESS, ENVIRONMENTAL COMPATIBILITY, COST EFFECTIVENESS, AND COMPATIBILITY WITH CURRENT STANDARD PESTICIDE DISPERSAL EQUIPMENT.

PROGRESS: (U) 8010-8109. ABATE CONTROLLED RELEASE BIMODAL PELLETS OFFER THE ADVANTAGE OF BEING ABLE TO FLOAT IN THE SILT-WATER INTERFACE IN THE BOTTOM OF AN AQUATIC ENVIRONMENT. PART OF THE PELLET WOULD EXTEND INTO THE WATER AND NOT BE COVERED. (THE ABATE SILICATE CONTROLLED-RELEASE PELLETS WERE PROBABLY COVERED IN THE PREVIOUS FIELD TESTS.) THE BIMODAL CONTROLLED-RELEASE PELLETS WERE TESTED IN THE LABORATORY IN DISTILLED WATER AND WERE EFFECTIVE FOR OVER 34 WEEKS. DURSBAN SILICATE CONTROLLED-RELEASE PELLETS WERE TESTED IN THE LABORATORY AND FOUND TO BE EFFECTIVE FOR AT LEAST 27 WEEKS. ALSO, WEEKLY WATER SAMPLES WERE TAKEN TO ANALYZE FOR DURSBAN RESIDUES AND COMPARE THESE VALUES TO THE LARVAL MORTALITY RATES.

PROCESSING DATE: 06 JAN 82

DETAIL SHEET

TITLE: (U) Pesticide Formulations, Controlled-Release, Environmentally Compatible

FUNDING HISTORY: PY - 87K; CY - 90K; BY - 102K

PROBLEM DEFINITION: To develop and register long-lasting and environmentally compatible pesticide formulations.

IMPORTANCE: Controlled-release environmentally degradable pesticide formulations systems are needed to replace the long-lasting, broad-spectrum pesticides, like DDT, that have been cancelled or suspended. The current formulations of new compounds are short-lived and have relatively short shelf life, thus are overall militarily less acceptable. These shortcomings can be overcome through application of a controlled-release formulation. This should result in reduced pesticide use, an important aspect of military vector control programs.

APPROACH: Controlled-release pesticide formulation system envisions the formulation of pesticides into carriers having chemical or physical characteristics that release the pesticide at a predetermined rate into the environment so that, after a given time, the pesticide and carrier are completely degraded.

ACHIEVEMENTS: Abate biomodal controlled-release pellets were tested in the laboratory and found to be effective for over 34 weeks. Dursban silicate controlled-release silicate pellets were tested in the laboratory and found to be effective for at least 27 weeks. Weekly water samples were taken to analyze these values to the larval mortality.

RELATIONSHIP TO CORE PROGRAM: This project is involved in evaluation and field testing of several new pesticide formulations. Outcome will provide the military with a new series of effective pesticides that are registered for medically important arthropods.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) FORWARD AREAS ;(U) TEST EQUIPMENT ;(U) LABORATORY EQUIPMENT ;(U) *MEDICAL EQUIPMENT ;(U) LIGHTWEIGHT ;(U) MODULAR CONSTRUCTION ;(U) HOMEOSTASIS ;(U) FIELD EQUIPMENT

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				DA086185		01 OCT 81	REPORT CONTROL SYMBOL FHP24C
01 OCT 80	D. CHANGE	U	U		NL	CONTRACT ACCESS YES ☒ NO ☐	A. WORK UNIT
DOD ACC CODES*	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
PRIMARY	63732A	3S463732D836		BA		006	
CONTRIB. NO							
CONTRIB. NO							

(U) FIELD CLINICAL ANALYSIS SYSTEM.

SCIENTIFIC AND TECHNOLOGICAL AREAS:

009800 MED HOSP EQ 010100 MICROBIOLOGY

START DATE	ESTIMATED COMPLETION DATE	FUNDING AGENCY	PERFORMANCE METHOD
OCT 76	SEP 82	DA	C. IN-HOUSE

CONTRACT/GRANT

DATES EFFECTIVE: EXPIRATION:

NUMBER:

TYPE: AMOUNT:

KIND OF AWARD: F. CUM/TOT: $ 0

RESOURCES ESTIMATE		PROFESSIONAL MAN YRS	FUNDS (in Thousands)
FISCAL YEAR	PREVIOUS 1981	0.4	$ 40
	CURRENT 1982	0.6	$ 19

RESPONSIBLE DOD ORGANIZATION: 407838 2406

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GENERAL USE

21A. B. C. D. E.

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SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME: REAMS, W.H.

NAME:

KEYWORDS (Precede EACH with Security Classification Code)

(U) LABORATORY EQUIPMENT ;(U) MEDICAL FIELD DEVICES ;(U) TEST KITS ;

TECHNICAL OBJECTIVE, APPROACH, PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO DEVELOP THROUGH EXPLORATORY STUDIES FIELD MEDICAL DEVICES AND LABORATORY EQUIPMENT FOR CLINICAL ANALYSIS OF BODY FLUIDS WITHIN ARMY FIELD MEDICAL UNITS.

APPROACH: (U) A PROBLEM DEFINITION STUDY WILL BE CONDUCTED TO DETERMINE FUNCTIONAL REQUIREMENTS OF A FIELD SYSTEM. LIGHTWEIGHT SELF-CONTAINED, RUGGEDIZED AND MODULAR COMPONENTS WILL BE DEVELOPED TO SATISFY THE IDENTIFIED REQUIREMENTS.

PROGRESS: (U) 8010 - 8109. A LIST OF TEST REQUIREMENTS HAS BEEN DEVELOPED. A SURVEY OF COMMERCIAL EQUIPMENT WILL BE CONDUCTED TO DETERMINE WHICH REQUIREMENTS CAN BE SATISFIED AND WHICH ITEMS CAN MEET FIELD NEEDS. A DRY-SLIDE TECHNOLOGY IS DEVELOPING WHICH HAS PROMISE OF MEETING FIELD NEEDS. THIS WILL REDUCE THE LOGISTIC BURDEN OF REAGENT SUPPLY AND STORAGE. THE TESTS AVAILABLE ARE EXPANDING.

PROCESSING DATE: 30 NOV 81

DETAIL SHEET

TITLE: (U) Field Clinical Analysis System

FUNDING HISTORY: PY - 22K; CY - 40K; BY - 19K

PROBLEM DEFINITION: To develop a modular, portable, and integrated clinical analysis system for the determination of clinically important body fluid parameters in a field environment.

IMPORTANCE: Currently used equipment is a mixture of various commercial equipment that has not been designed to operate in the field. Additionally, the use of different manufacturers' equipment for the same determination increases the logistic, training, and maintenance problems.

APPROACH: A determination of the various tests and location in the medical care chain will be determined. A survey of the procedures available to make the desired test will be made. Then a system will be developed that will use common procedures for as many tests as possible and that will provide a modular and integrated system.

ACHIEVEMENTS: Two lists of tests, one for "sick-call" and one for combat casualties, have been obtained and compared for duplication. The tests have been grouped according to the determination method used. A survey of commercial items is under way. A dry slide technology is developing but, as yet, will not satisfy the stated requirements.

RELATIONSHIP TO CORE PROGRAM: This program is directly related to the Laboratory's mission of developing field medical equipment.

MEDICAL SYSTEMS IN NONCONVENTIONAL ENVIRONMENTS

...CHEMICAL WARFARE
...ON EQUIPMENT (U)

	REPORT CONTROL SYMBOL: DHP24C
	WORK UNIT NUMBER
	IN-HOUSE
	$ 82
	$ 80
	407638 2405
	ENGINEERING R&D LAB

(U) CHEMICAL WARFARE CASUALTIES ;(U) FIELD MATERIEL ;(U)
MEDICAL MATERIEL ;(U) PATIENT DECONTAMINATION ;(U) DECONTAMINATION APPARATUS ;

OBJECTIVE: (U) TO DEVELOP MEDICAL MATERIEL FOR THE DECONTAMINATION OF PATIENTS EXPOSED TO CHEMICAL WARFARE AGENTS.

APPROACH: (U) CONDUCT THOROUGH EVALUATION OF ALL KNOWN METHODS OF DECONTAMINATION FOR POTENTIAL CANDIDATES AND EVALUATE.

PROGRESS: (U) 8010 - 8109. COMMERCIAL SOURCES WERE CANVASED FOR MATERIALS AND EQUIPMENT SUITABLE FOR PATIENT DECONTAMINATION APPARATUS. CONTACT MADE WITH OTHER DOD ORGANIZATIONS CONCERNING CONCEPT OF OPERATION AND PROBLEMS IN MEDICAL DEFENSE CHEMICAL WARFARE. TECHNICAL DATA BASE FOR PATIENT DECONTAMINATION BEING EXPANDED.

PROCESSING DATE: 30 NOV 81

DETAIL SHEET

TITLE: (U) Patient Decontamination Apparatus

FUNDING HISTORY: PY - 0; CY - 82K; BY - 80K

PROBLEM DEFINITION: The use of toxic chemical agents (TCA) on the integrated battlefield will produce large numbers of chemically contaminated patients. Currently, the US Army does not have any equipment to decontaminate chemically contaminated patients.

IMPORTANCE: It is important to decontaminate patients quickly to save lives, reduce effects of TCA, and to prevent contamination of medical personnel.

APPROACH: Methods, equipment, and materials used by industry and foreign military organizations are being reviewed. Based on investigations and current doctrine, breadboard models are under development.

ACHIEVEMENTS: A breadboard washing system using a modified Army litter, pump, and water collector was fabricated and sent to field units for evaluation.

RELATIONSHIP TO CORE PROGRAM: The program directly relates to the Laboratory's mission to develop field medical materiel.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) WORK ;(U) VENTILATION ;(U) RESUSCITATION ;(U) MEDICAL EQUIPMENT ;(U) MATERIEL ;(U) FIELD CONDITIONS ;(U) CHEMICAL WARFARE CASUALTIES ,(U) CHEMICAL WARFARE ;(U) CASUALTIES ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY	AGENCY ACCESSION: DAOG2840	DATE OF SUMMARY: 01 OCT 81	REPORT CONTROL SYMBOL: FHP24C

DATE PREV SUM'RY	KIND OF SUMMARY	SUMMARY SCTY	WORK SECURITY	REGRADING	DISTRIBUTION INSTR'N	SPECIFIC DATA-CONTRACTOR ACCESS	LEVEL OF SUM
30 SEP 80	D. CHANGE	U	U		NL	☒ YES ☐ NO	A. WORK UNIT

NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
PRIMARY	62734A	3M162734A875	BB	222
CONTRIBUTING				
CONTRIBUTING				

TITLE (Precede with Security Classification Code): (U) DEVELOPMENT OF RESUSCITATIVE EQUIPMENT FOR MASS CASUALTIES IN A CHEMICAL WARFARE ENVIRONMENT

SCIENTIFIC AND TECHNOLOGICAL AREAS: 002400 BIOENGINEERING 003200 CHM & BIO DEFENSE 009800 MED HOSP

START DATE	ESTIMATED COMPLETION DATE	FUNDING AGENCY	PERFORMANCE METHOD
JUN 80	DEC 86	DA	C. IN-HOUSE

CONTRACT GRANT: DATES/EFFECTIVE: EXPIRATION: NUMBER: TYPE: d. AMOUNT: KIND OF AWARD: f. CUM/TOT: $ 0

RESOURCES ESTIMATE		a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR PRECEDING	1981	0.8	$ 111
FISCAL YEAR CURRENT	1982	1.6	$ 90

RESPONSIBLE DOD ORGANIZATION: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701
RESPONSIBLE INDIVIDUAL
NAME: HAMES, W H
TELEPHONE: 3016637277

PERFORMING ORGANIZATION: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701
PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)
NAME: MALEK, J W
TELEPHONE: 3016637277
SOCIAL SECURITY ACCOUNT NUMBER
ASSOCIATE INVESTIGATORS
NAME
NAME

GENERAL USE: 21A. B. C. D. E.

KEYWORDS (Precede EACH with Security Classification Code): (U) RESUSCITATION ;(U) CHEMICAL WARFARE CASUALTIES ;(U) FIELD ;(U) MEDICAL MATERIEL ;(U) BREATHING ;(U) VENTILATION

TECHNICAL OBJECTIVE, APPROACH, PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO DEVELOP A PORTABLE, MECHANICAL UNIT SUITABLE FOR THE VENTILATION OF MASS CHEMICAL WARFARE CASUALTIES IN A CONTAMINATED ATMOSPHERE UNDER FIELD CONDITIONS.

APPROACH: (U) DESIGN, FABRICATE AND EVALUATE A UNIT TO MEET ESTABLISHED CRITERIA.

PROGRESS: (U) 8010 - 8109. DEVELOPMENT DELAYED DUE TO UNAVAILABILITY OF MOLDED RUBBER PARTS. A SOURCE FINALLY LOCATED DURING 4TH QUARTER 81 AND DEVELOPMENT EFFORT CONTINUING. DLOA DOCUMENT PREPARED AND BEING COORDINATED WITH INTERESTED PARTIES. RFQ PREPARED AND CONTRACT WITH COMMERCIAL FIRM(S) ANTICIPATED DURING FY 82.

*Available to contractors upon originator's approval

PROCESSING DATE: 30 NOV 81

DD FORM MAY 68 1498M DTIC FORMAT 850 PAGE 51

DETAIL SHEET

[illegible] Equipment for Mass Casualties in a [illegible] Warfare Environment

[illegible] 10K; FY - 00K

[illegible] today that can ventilate chemical [illegible]. Personnel surviving an initial exposure [illegible] exhibit failure to breathe properly and will [illegible].

[illegible] chemical warfare casualties will place a [illegible] personnel. Equipment designed to handle many [illegible], will help both the medical personnel and [illegible] of the patient to survive.

[illegible] established for a prior piece of equipment [illegible] expanded to place anywhere from one to [illegible] piece of apparatus.

[illegible] model was fabricated but not evaluated.

[illegible] The program is directly related to the [illegible] develop field medical materiel.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) DELIVERY ;(U) MILITARY APPLICATIONS ;(U) MARKET RESEARCH ;(U) WORK

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				AGENCY ACCESSION	DATE OF SUMMARY	REPORT CONTROL SYMBOL
				DAOG2702	01 OCT 81	FHP24C
DATE PREV SUM'RY: 30 SEP 80	KIND OF SUMMARY: D. CHANGE	SUMMARY SCTY: U	WORK SECURITY: U	REGRADING	DISTRIBUTION INSTR: NL	SPECIFIC DATA CONTRACTOR ACCESS: [X] YES [ ] NO / LEVEL OF SUM: A. WORK UNIT

NO./CODES:*	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
PRIMARY	62734A	3M162734A875	BB	223
CONTRIBUTING				
CONTRIBUTING				

TITLE (Precede with Security Classification Code): (U) TECHNICAL FEASIBILITY TESTING (TFT) OF DELIVERY SYSTEMS FOR CHEMICAL WARFARE MEDICAMENTS

SCIENTIFIC AND TECHNOLOGICAL AREAS: 002400 BIOENGINEERING 003200 CHM & BIO DEFENSE 009800 MED HOSP

START DATE: MAY 80 | ESTIMATED COMPLETION DATE: CONT | FUNDING AGENCY: DA | PERFORMANCE METHOD: C. IN-HOUSE

CONTRACT/GRANT
- DATES/EFFECTIVE: EXPIRATION:
- NUMBER:
- TYPE: AMOUNT:
- KIND OF AWARD: F. CUM/TOT: $ 0

RESOURCES ESTIMATE		PROFESSIONAL MAN YRS	FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	0.5	$ 50
	CURRENT 1982	0.1	$ 20

RESPONSIBLE DOD ORGANIZATION: 407838 2406
- NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
- ADDRESS: FT DETRICK MD 21701
- RESPONSIBLE INDIVIDUAL
- NAME: HAMES, W H
- TELEPHONE: 3016637277

PERFORMING ORGANIZATION: 407838 2406
- NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
- ADDRESS: FT DETRICK MD 21701
- PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)
- NAME: MALEK, J W
- TELEPHONE: 3016637277
- SOCIAL SECURITY ACCOUNT NUMBER
- ASSOCIATE INVESTIGATORS
- NAME
- NAME

GENERAL USE: 21A. B. C. D. E.

KEYWORDS (Precede EACH with Security Classification Code): (U) DELIVERY SYSTEMS ;(U) INJECTORS ;(U) INJECTION METHODS ;(U) AUTOMATIC INJECTORS ;(U) CHEMICAL WARFARE ANTIDOTES ;(U) FIELD MEDICAL

TECHNICAL OBJECTIVE, APPROACH, PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO EVALUATE ANY AND ALL KINDS OF ANTIDOTE DELIVERY SYSTEMS TO DETERMINE THE BEST METHOD/APPLIANCE TO CONTAIN CHEMICAL WARFARE MEDICAMENTS.

APPROACH: (U) CONDUCT MARKET RESEARCH TO DETERMINE POSSIBLE METHODS/APPLIANCES. OBTAIN PROTOTYPES AND EVALUATE FOR POTENTIAL USE AGAINST ESTABLISHED MILITARY CHARACTERISTICS.

PROGRESS: (U) 8010 - 8109. INITIAL EVALUATION OF ALL KNOWN COMMERCIAL INJECTORS WAS COMPLETED 1ST QUARTER 82. A SECOND EVALUATION SUBJECTING THE MOST PROMISING CANDIDATES TO MILITARY TYPE REQUIREMENTS WAS COMPLETED 2ND QUARTER 82. AN ENGINEERING EVALUATION REPORT ANALYZING THE EVALUATIONS WAS CONDUCTED AND FORWARDED TO THE TASK FORCE DIRECTOR DURING 2ND QUARTER 82. PROGRAM BEING MAINTAINED TO SUPPORT THE TASK FORCE DIRECTOR IN PROCURING COMPLETED INJECTORS WITH 2 PA OF CHLORIDE MEDICAMENT.

Available to contractors upon originator's approval

PROCESSING DATE: 06 JAN 82

[illegible] Systems for
Chemical [illegible]

[illegible]

PROBLEM DEFINITION: [illegible] delivery systems to provide personnel with [illegible] is to review and evaluate the various known types of systems [illegible] the best method qualities.

EMERGENCY: [illegible] drugs that may be administered by individuals. [illegible] contaminated chemical warfare environment will need [illegible] immediate use.

APPROACH: All known commercial injection systems were searched and obtained. A list of major characteristics [illegible] and each method/system will be evaluated against these characteristics to determine which method/system is the best to contain medicaments.

ACHIEVEMENTS: Purchase specifications for 2-Pam Chloride were reviewed and comments were forwarded to task force. Vibration tests on Mark I coupler were initiated and completed during 4QS2.

RELATIONSHIP TO CORE PROGRAM: The program is directly related to the Laboratory's mission to develop field medical materiel.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) PERSONNEL MANAGEMENT ;(U) PATIENTS ;(U) NUCLEAR WARFARE ;(U) MEDICAL EQUIPMENT ;(U) MATERIEL ;(U) FIELD EQUIPMENT ;(U) CHEMICAL WARFARE ;(U) BIOLOGICAL WARFARE ;(U) WORK ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

Agency accession: DAOG1894	Date of summary: 01 OCT 81	Report control symbol: FHP24C		
Date prev summary: 01 OCT 80	Kind of summary: D. CHANGE	Summary scty: U	Work security: U	Distribution: NL
Specific data contractor access: YES [X] NO [ ]	Level of sum: A. WORK UNIT			

NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62734A	3M162734A875	BB	024
b. CONTRIBUTING				
c. CONTRIBUTING				

Title: (U) EVALUATION OF FOREIGN MEDICAL MATERIEL FOR USE IN A CONTAMINATED ENVIRONMENT

Scientific and technological areas: 003200 CHM & BIO DEFENSE 002400 BIOENGINEERING 009800 MED HOSP

Start date: JAN 80 — Estimated completion date: CONT — Funding agency: DA — Performance method: C. IN-HOUSE

Contract/grant: F. CUM/TOT: $ 0

Resources estimate		Professional man yrs	Funds (in thousands)
Fiscal year	Preceding 1981	0.3	$ 12
	Current 1982	0.1	$ 20

Responsible DOD organization: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701
Responsible individual
NAME: HAMES, W. H., LTC
TELEPHONE: 3016637277
General use: 21A B C D E

Performing organization: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701
PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)
NAME: MALEK, J.W.
TELEPHONE: 3016637277
SOCIAL SECURITY ACCOUNT NUMBER
ASSOCIATE INVESTIGATORS
NAME
NAME

Keywords: (U) CHEMICAL ;(U) BIOLOGICAL ;(U) NUCLEAR ;(U) FIELD EQUIPMENT ;(U) MEDICAL MATERIEL ;(U) EVALUATION ;(U) CASUALTY MANAGEMENT ;(U) PATIENT

OBJECTIVE:(U) TO EVALUATE FOREIGN MEDICAL MATERIAL/TECHNOLOGY/DOCTRINE FOR AMEDD ADOPTION AND USE IN CONTAMINATED FIELD ENVIRONMENTS. CONTAMINATED ENVIRONMENTS INCLUDING NUCLEAR, BIOLOGICAL AND CHEMICAL WARFARE. EVALUATION AND ADOPTION OF SELECTED FOREIGN MEDICAL MATERIEL/TECHNOLOGY/DOCTRINE CAN RAPIDLY AND EFFECTIVELY IMPROVE AMEDD'S CASUALTY MANAGEMENT CAPABILITIES.

APPROACH (U) START EVALUATION OF THE FEDERAL REPUBLIC OF GERMANY'S FOREIGN MEDICAL MATERIEL/TECHNOLOGY/DOCTRINE FOR PATIENT HANDLING N A CHEMICAL WARFARE ENVIRONMENT.

PROGRESS (U) 8010-8109. REPORTS ON EQUIPMENT AND/OR PROCEDURES EMANATING FROM FOREIGN SOURCES ARE CAREFULLY REVIEWED FOR POTENTIAL U.S. USE. CONTACTS WITH ENGLAND AND GERMANY MADE TO OBTAIN EQUIPMENT FOR EVALUATION.

PROCESSING DATE: 06 JAN 82

DETAIL SHEET

TITLE: (U) Evaluation of Foreign Medical Materiel for Use in a Contaminated Environment

FUNDING HISTORY: PY - 27K; CY - 12K; BY - 20K

PROBLEM DEFINITION: Several foreign countries have developed doctrine/technology/materiel for patient handling and treatment in contaminated field environments (nuclear, biological, and chemical). To improve AMEDD's casualty management capabilities rapidly and effectively, observance and evaluation of selected foreign medical materiel will be addressed.

IMPORTANCE: AMEDD's doctrine for treatment and handling of field patients is currently being upgraded. Evaluation of foreign materiel would improve, enhance, and speed up positioning of critical materiel to field elements.

APPROACH: Intelligence documents are constantly reviewed for possible candidate materiel.

ACHIEVEMENTS: British materiel (MARK III and MARK IV) for use in fabricating patient protective evacuation bags is being used by NATICK Labs. Comparison of chemcial protection of British materiel is being conducted by NATICK Labs.

RELATIONSHIP TO CORE PROGRAM: The program is directly related to the Laboratory's mission to develop field medical materiel.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA 0B 6251	81 10 01	DD-DR&E(AR)636

3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8a. DISP'N INSTR'N	8b. SPECIFIC DATA-CONTRACTOR ACCESS	9. LEVEL OF SUM
80 12 01	B. TERMINATION	U	U		NL	☒ YES ☐ NO	A. WORK UNIT

10. NO. CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62772A	3S162772A875	CA	225 APC F352
b. CONTRIBUTING				
c. [redacted]	STOC 80-7.2:1			

11. TITLE (Precede with Security Classification Code)

(U) Technical Feasibility Testing (TFT) of Medical Equipment

12. SCIENTIFIC AND TECHNOLOGICAL AREAS

002400 Bioengineering; 009800 Medical and Hospital Equipment;

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
7903	8309	DA	C. In-House

17. CONTRACT GRANT

a. DATES/EFFECTIVE: EXPIRATION:
b. NUMBER:
c. TYPE: d. AMOUNT:
e. KIND OF AWARD: f. CUM. AMT.

18. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (In thousands)
PRECEDING FISCAL YEAR 81	0.4	29
CURRENT FISCAL YEAR 82	0.0	00

19. RESPONSIBLE DOD ORGANIZATION

NAME: US Army Medical Bioengineering Research & Development Laboratory
ADDRESS: Fort Detrick, Frederick, MD 21701

RESPONSIBLE INDIVIDUAL
NAME: Hames, W.H., LTC
TELEPHONE: (301) 663-7277; AUTOVON 343-7277

20. PERFORMING ORGANIZATION

NAME: US Army Medical Bioengineering Research & Development Laboratory
ADDRESS: Fort Detrick, Frederick, MD 21701

PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)
NAME: Conway, W.H.
TELEPHONE: (301) 663-7237; AUTOVON 343-7237
SOCIAL SECURITY ACCOUNT NUMBER:

ASSOCIATE INVESTIGATORS
NAME:
NAME:

21. GENERAL USE

Foreign Intelligence Considered

POC:DA

22. KEYWORDS (Precede EACH with Security Classification Code)

(U) Medical Equipment; (U) Field Medicine; (U) Testing

23. TECHNICAL OBJECTIVE; 24. APPROACH; 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code.)

23. (U) To technically evaluate medical items and systems developed by another service, a foreign nation, or a commercial firm. Results provide input for requirement documents, development plans, or product improvement proposals.

24. (U) Specific items are evaluated for military relevancy after initiation by letter request from major commands, Military Intelligence Information Agency, or Department of Defense activities. Test protocols are written for each item evaluated and a final report written outlining specific recommendations.

25. (U) 8012 - 8109. Task has been inactive during the period with most of the studies initiated here having been converted to requirements documents. Task terminated due to uncertainty over new work in this category.

*Available to contractors upon originator's approval

DD FORM 1 MAR 68 1498 PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. DD FORMS 1498A 1 NOV 65 AND 1498-1 1 MAR 68 (FOR ARMY USE) ARE OBSOLETE

☆U.S. GPO: 1981—341-646/8290

DETAIL SHEET

TITLE: (U) Technical Feasibility Testing of Medical Equipment

FUNDING HISTORY: PY - 55K; CY - 29K; BY - 0

PROBLEM DEFINITION: To conduct an ongoing program of evaluating promising items of foreign or commercial medical equipment and instrumentation for possible application in the field. This effort also serves to maintain a technology base for the Laboratory.

IMPORTANCE: From time to time new and interesting developments come to light in medical equipment having potential importance to the Army. These developments may come from the commercial market or may surface from intelligence sources. A mechanism must exist for conducting preliminary evaluations of such equipment without being driven by specific requirements.

APPROACH: To maintain an open work unit, funded at a modest level, which will permit periodic market surveys, evaluation of intelligence reports on foreign equipment, and the occasional procurement and evaluation of items of interest. The task also allows for the investigation of complaints against existing field equipment to provide a comparison base for evaluating new ideas and equipment.

ACHIEVEMENTS: This task was inactive during the FY 81 period, with most of the investigations undertaken during the previous FY having been converted to firm requirements.

RELATIONSHIP TO CORE PROGRAM: This task is consistent with the Laboratory's mission to develop medical field equipment.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) ARMY PERSONNEL ;(U) CHEMICAL WARFARE CASUALTIES ;(U) INDUSTRIES ;(U) MATERIEL ;(U) MEDICAL EQUIPMENT ;(U) RESUSCITATION ;(U) VENTILATION

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

AGENCY ACCESSION: DAOG1512	DATE OF SUMMARY: 01 OCT 81	REPORT CONTROL SYMBOL: FHP24C			
DATE PREV SUM'RY: 15 MAY 81	KIND OF SUMMARY: D. CHANGE	SUMMARY SCTY: U	WORK SECURITY: U	DISTRIBUTION INSTR'N: NL	SPECIFIC DATA-CONTRACTOR ACCESS: YES [X] NO [ ] / LEVEL OF SUM: A. WORK UNIT

NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
PRIMARY	62734A	3M162734A875	BB	226
CONTRIBUTING				
CONTRIBUTING				

TITLE: (U) RESUSCITATION DEVICE INDIVIDUAL, CHEMICAL

SCIENTIFIC AND TECHNOLOGICAL AREAS: 002400 BIOENGINEERING 003200 CHM & BIO DEFENSE 009800 MED HOSP

START DATE: MAY 81 | ESTIMATED COMPLETION DATE: JUN 84 | FUNDING AGENCY: DA | PERFORMANCE METHOD: C. IN-HOUSE

CONTRACT/GRANT: KIND OF AWARD: F. CUM/TOT: $ 0

RESOURCES ESTIMATE		PROFESSIONAL MAN YRS	FUNDS (In Thousands)
FISCAL YEAR PRECEDING	1981	0.1	$ 2
CURRENT	1982	0.1	$ 19

RESPONSIBLE DOD ORGANIZATION: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701
RESPONSIBLE INDIVIDUAL
NAME: HAMES, W H
TELEPHONE: 3016637277

PERFORMING ORGANIZATION: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701
PRINCIPAL INVESTIGATOR
NAME: MALEK, J W
TELEPHONE: 3016637277
SOCIAL SECURITY ACCOUNT NUMBER
ASSOCIATE INVESTIGATORS
NAME
NAME

GENERAL USE: 21A. B. C. D. E.

KEYWORDS: (U) RESUSCITATION ;(U) CHEMICAL WARFARE CASUALTY ;(U) FIELD ;(U) MEDICAL MATERIEL ;(U) VENTILATION ;(U) BREATHING

OBJECTIVE:(U) TO DEVELOP A LIGHTWEIGHT COMPACT MANUAL MECHANICAL DEVICE TO VENTILATE CHEMICAL WARFARE CASUALTIES, WHICH CAN BE OPERATED BY AN INDIVIDUAL SOLDIER.

APPROACH: (U) DESIGN AN APPROACH AND CONTACT INDUSTRY FOR FABRICATION; TEST AND EVALUATE PROTOTYPES.

PROGRESS: (U) 8105-8109. PROTOTYPE SEGMENTS WERE FABRICATED AND FORWARDED TO USAMRICD, EDGEWOOD, MD, FOR INITIAL EVALUATION. AN RFQ WAS PREPARED AND FORWARDED FOR INDUSTRIAL FABRICATION OF ADDITIONAL UNITS. ANTICIPATE CONTRACT WILL BE ISSUED DURING 2ND QUARTER 82.

Available to contractors upon originator's approval

PROCESSING DATE: 31 DEC 81

DETAIL SHEET

TITLE: (U) Resuscitation Device, Individual, Chemical

FUNDING HISTORY: PY - 0; CY - 2K; BY - 19K

PROBLEM DEFINITION: No equipment exists today that can ventilate a chemical warfare casualty using the "Buddy-aid" system. Personnel overcome by a chemical agent attack will require ventilation assistance.

IMPORTANCE: Providing lightweight and mechanical equipment to front-line troops will help a number of chemical agent casualties to be revived and maintained until proper medical assistance can be provided.

APPROACH: Designs that will not expose casualties to further contamination are being investigated. Current efforts are being expended and investigated to develop a system whereby the casualty's mask is not removed and pressurized aid is provided by a mechanical hand-operated device.

ACHIEVEMENTS: Design, fabrication, and evaluation of the first breadboard model have been accomplished with fair results.

RELATIONSHIP TO CORE PROGRAM: The program is directly related to the Laboratory's mission to develop field medical materiel.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) CHEMICAL AGENTS ;(U) CHEMICAL ATTACK(DEGRADATION) ;(U) CHEMICAL LABORATORIES ;(U) CHEMICAL REACTIONS;(U) CHEMICAL WARFARE ;(U) CHEMICAL WARFARE AGENTS ;(U) CHEMISTRY ;(U) CONTAMINATION ;(U) DECONTAMINATION ;(U) FIELD CONDITIONS ;(U)

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

Agency Accession	Date of Summary	Report Control Symbol
DAOG1513	01 OCT 81	FHP24C

Date Prev Sum'ry	Kind of Summary	Summary Scty	Work Security	Regrading	Distribution Instr'n	Specific Data-Contractor Access	Level of Sum
15 MAY 81	D. CHANGE	U	U		NL	[X] YES [ ] NO	A. WORK UNIT

10. NO./CODES:*	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
PRIMARY	62734A	3M162734A875	BA	227
CONTRIBUTING				
CONTRIBUTING				

TITLE: (U) HARDENING OF MEDICAL MATERIEL AGAINST CHEMICAL WARFARE AGENTS

SCIENTIFIC AND TECHNOLOGICAL AREAS: 002400 BIOENGINEERING 003200 CHM & BIO DEFENSE 009800 MED HOSP

Start Date	Estimated Completion Date	Funding Agency	Performance Method
MAY 81	CONT	DA	C. IN-HOUSE

CONTRACT/GRANT: a. DATES/EFFECTIVE: EXPIRATION: b. NUMBER: c. TYPE: d. AMOUNT: e. KIND OF AWARD: f. CUM/TOT: $ 0

18 RESOURCES ESTIMATE		a PROFESSIONAL MAN YRS	b FUNDS (in Thousands)
FISCAL YEAR	PRECEDING 1981	0.1	$ 3
	CURRENT 1982	0.9	$ 30

RESPONSIBLE DOD ORGANIZATION: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701
RESPONSIBLE INDIVIDUAL
NAME: HAMES, W. H., LTC
TELEPHONE: 3016637277

20 PERFORMING ORGANIZATION: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701
PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)
NAME: PATZER, N H
TELEPHONE: 3016637277
SOCIAL SECURITY ACCOUNT NUMBER
ASSOCIATE INVESTIGATORS
NAME
NAME

GENERAL USE: 21A. B. C. D. E.

KEYWORDS: (U) CHEMICAL WARFARE ;(U) FIELD MATERIEL ;(U) MEDICAL MATERIEL ;(U) CHEMICAL HARDENING;(U) DECONTAMINATION ;(U) CHEMICAL AGENT PROTECTION ;

OBJECTIVE:(U) TO CHEMICALLY HARDEN EXISTING AND FUTURE FIELD MEDICAL MATERIEL FOR RESISTANCE TO CONTAMINATION AND DECONTAMINATION AGENTS.

APPROACH: (U) EVALUATE MATERIALS, METHODS, DESIGNS AND EQUIPMENT FOR CHEMICAL AGENT RESISTANCE IN COORDINATION WITH THE CHEMICAL SYSTEMS LABORATORY, EDGEWOOD, MD AND ADVISE MATERIEL DEVELOPERS AND PROCURING ACTIVITIES OF THE RESULTS AND PROPER APPROACH.

PROGRESS: (U) 8105 - 8109. RECOMMENDED TO AMEDD ADOPTION OF CHEMIAL WARFARE AGENT RESISTANT COATINGS FOR COMBAT ZONE EQUIPMENT. CONTACT WITH COMMERCIAL SOURCES FOR AVAILABILITY OF RUBBER GASKETS RESISTANT TO CHEMICAL WARFARE AGENTS AND MILITARY DECONTAMINATING SOLUTIONS. RFQ TO OBTAIN GASKET MATERIAL INITIATED.

PROCESSING DATE: 30 NOV 81

DETAIL SHEET

TITLE: (U) Hardening of Medical Materiel Against Chemical Warfare Agents

FUNDING HISTORY: PY - 0; CY - 3K; BY - 30K

PROBLEM DEFINITION: AMMED capabilities to achieve its mission on the integrated battlefield depends on the contamination survivability of mission essential materiel.

IMPORTANCE: Current AMMED materiel will not survive contamination by toxic chemical agents (TCA) and decontamination solutions without loss of essential and RAM characteristics.

APPROACH: Develop hardened transport cases that will prevent contamination of medical materiel. Quick-fix improvements to current medical supply chests will protect most medical materiel for the near term.

ACHIEVEMENTS: New gasket (seal) for medical supply chest is under development. Handles and latches on medical supply chest are under study to harden for ease of decontamination.

RELATIONSHIP TO CORE PROGRAM: The program is directly related to the Laboratory's mission to develop field medical materiel.

COMBAT MEDICAL MATERIEL

UNCLASSIFIED

(U) DISEASE VECTORS ;(U) ARTHROPODA ;(U) PESTICIDES ;(U) FORMULATIONS;(U) WARFARE ;(U) UNITED

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY | DA OG 0377 | 01 OCT 81 | REPORT CONTROL SYMBOL FHP24C

CHANGE | U | NL | CONTRACTOR ACCESS: YES [x] NO | A. WORK UNIT

PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
64717A	3S464717D832	AA	003

SPRAYER, POWERED, ULV, PORTABLE

MED HOSP EQ | 002400 BIOENGINEERING

SEP 82	DA		C. IN-HOUSE

FISCAL YEAR		PROFESSIONAL MAN YRS	FUNDS (In Thousands)
	1981	0.1	$ 8
	1982	0.5	$ 16

F. CUM/TOT $ 0

RESPONSIBLE DOD ORGANIZATION	PERFORMING ORGANIZATION
407838 2406	407838 2406
NAME: USAMBRDL MEDICAL BIOENGINEERING R&D LAB	NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701	ADDRESS: FT DETRICK MD 21701
RESPONSIBLE INDIVIDUAL NAME: HAMES, W. H., LTC	PRINCIPAL INVESTIGATOR NAME: PIERCE, P. E.
TELEPHONE: 3016637237	TELEPHONE: 3016637237
	ASSOCIATE INVESTIGATORS NAME: CONWAY, W. H.

A. B. C. D. E.

KEYWORDS: (U) BACKPACK ;(U) ULV DISPERAL;(U) ARTHROPOD CONTROL ;(U) LIGHTWEIGHT ;(U) DURABLE ;(U) DISEASE VECTORS ;(U) PORTABLE ;

OBJECTIVE:(U) TO IDENTIFY A COMMERCIALLY AVAILABLE, LIGHTWEIGHT, DURABLE, PORTABLE UNIT CAPABLE OF DISPERSING ULV PESTICIDE FORMULATIONS. THIS UNIT WOULD BE USED BY PREVENTIVE MEDICINE PERSONNEL IN COMBAT ZONES AND CONUS FOR CONTROLLING DISEASE VECTORS AND PEST ARTHROPODS.

APPROACH: (U) A REVIEW OF COMMERCIALLY AVAILABLE PORTABLE ULV UNITS WILL BE MADE. SUITABLE UNITS WILL BE FIELD EVALUATED AFTER ENTOMOLOGICAL FEASIBILITY HAS BEEN ESTABLISHED. MODIFICATIONS, IF NECESSARY, WILL BE MADE AND FORMAL TESTING COORDINATED WITH RESPONSIBLE AGENCIES.

PROGRESS: (U) 8010 - 8109. EVALUATIONS INDICATE GASOLINE ENGINE UNIT MANUFACTURED BY MICRO GEN IS THE BEST AVAILABLE UNIT. RECOMMENDATION TO PURSUE NDI STRATEGY WILL BE MADE IN FY82.

PROCESSING DATE: 30 NOV 81

DETAIL SHEET

TITLE: (U) Sprayer, Powered, ULV, Portable

FUNDING HISTORY: PY - 0; CY - 8K; BY - 16K

PROBLEM DEFINITION: To evaluate commercial hand-held ULV sprayers for adoption of an acceptable item into TOE units.

IMPORTANCE: Previous experiences in Southeast Asia and the Mideast have demonstrated the devastating effect outbreaks of arthropod-borne diseases can have on field operations. Many outbreaks start from a small localized area, too big for a field sanitation team to handle but too small for efficient treatment using current Corps equipment. To fill this technical gap, a small portable ULV sprayer could be used for local control of flies and mosquitoes.

APPROACH: To evaluate several commercially available hand-held ULV sprayers which are either gasoline engine driven or battery powered. Units that pass engineering criteria will be subjected to NDI strategy.

ACHIEVEMENTS: Feasibility/developmental testing of gasoline engine driven and battery-powered units completed. A gasoline engine model made by the Micro-Gen Corporation (San Antonio, TX) for the Navy has been selected as a more promising item.

RELATIONSHIP TO CORE PROGRAM: Project involves engineering and operational evaluation of insecticide dispersal equipment for inclosure in TOE of field medical units.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) ARCTIC REGIONS ;(U) *BAGS ;(U) BODY TEMPERATURE ;(U) CASUALTIES ;(U) *CONTROLLED ATMOSPHERES ;(U) EVACUATION ;(U) HEATING ELEMENTS ;(U) HUMANS ;(U) MEDICAL EQUIPMENT ;(U) MILITARY MEDICINE ;(U) TEMPERATURE CONTROL ;(U) TRANSPORTATION

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

AGENCY ACCESSION	DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0A6282	01 OCT 81	FHP24C

DATE PREV SUM'RY	KIND OF SUMMARY	SUMMARY SYS	WORK SECURITY	REGRADING	DISTRIBUTION INSTR	SPECIFIC DATA	LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	[X] CONTRACTOR ACCESS YES [ ] NO	A. WORK UNIT

NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
PRIMARY	64717A	3S4647170832	BB	004
CONTRIBUTING				
CONTRIBUTING				

TITLE (Precede with Security Classification Code)

(U) BAG, PATIENT HOLDING AND EVACUATION, PROTOTYPE DESIGN AND FABRICATION

SCIENTIFIC AND TECHNOLOGICAL AREAS

009800 MED HOSP EQ 002400 BIOENGINEERING

START DATE	ESTIMATED COMPLETION DATE	FUNDING AGENCY	PERFORMANCE METHOD
APR 73	SEP 82	DA	C. IN-HOUSE

CONTRACT/GRANT

DATES EFFECTIVE: EXPIRATION:

NUMBER:

TYPE: AMOUNT:

KIND OF AWARD: F. CUM/TOT: $ 0

RESOURCES ESTIMATE	PROFESSIONAL MAN YRS	FUNDS (In Thousands)
FISCAL YEAR PRECEDING 1981	0.6	$ 20
FISCAL YEAR CURRENT 1982	0.5	$ 36

RESPONSIBLE DOD ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

RESPONSIBLE INDIVIDUAL

NAME: HAMES, W. H., LTC

TELEPHONE: 3016637277

GENERAL USE

21A. B. C. D. E.

PERFORMING ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)

NAME: THAYER, C. R.

TELEPHONE: 3016637237

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME: CONWAY, W H

NAME:

KEYWORDS (Precede EACH with Security Classification Code)

(U) EVACUATION BAG ;(U) COLD CLIMATE MEDICAL MATERIAL ;(U) ARCTIC MEDICINE ;(U) PATIENTS, TRANSPORTATION OF ;

TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code.)

OBJECTIVE:(U) TO DEVELOP A PATIENT HOLDING AND EVACUATION SYSTEM CAPABLE OF MAINTAINING CASUALTIES OF DESIRED, CONTROLLED TEMPERATURES IN EXTREME COLD CLIMATES FOR PROLONGED PERIODS. THE CURRENT FIELD MEANS OF PROTECTING INJURED/SICK FIELD PERSONNEL IN A COLD ENVIRONMENT FROM ADDITIONAL COMPLICATIONS RESULTING FROM EXPOSURE TO THE COLD IS INADEQUATE FROM THE POINT OF INFLICTION THROUGH THE EVACUATION SYSTEM.

APPROACH: (U) DESIGN AND FABRICATE DEVELOPMENTAL PROTOTYPES BASED UPON PREVIOUS ENGINEERING EFFORT. EXISTING STATE-OF-THE-ART MATERIEL WILL BE USED. MAJOR TECHNICAL BARRIER IS TO ACHIEVE REQUIRED TEMPERATURE DURATION CAPABILITY WITH REQUIRED LIGHTWEIGHT CHARACTERISTICS.

PROGRESS: (U) 8010 - 8109. FUNCTIONAL PROBLEMS ENCOUNTERED WITH THE PROPANE FUELED PROTOTYPE HAVE BEEN ASSESSED AS REQUIRING NONTRIVIAL SOLUTIONS, AND THE FIRM THAT DEVELOPED THE UNIT HAS GONE OUT OF BUSINESS, THUS COMPLICATING THE PROBLEM. MEANWHILE, A REPORT HAS BEEN RECEIVED ON A NORWEIGN CHARCOAL FUELED DEVICE THAT LOOKS VERY PROMISING, AND EFFORTS ARE UNDERWAY TO PROCURE A SPECIMEN OF THAT EQUIPMENT FOR EVALUATION.

*Available to contractors upon originators approval

PROCESSING DATE: 10 MAR 82

DD FORM MAY 88 1498M DTIC FORMAT 850 PAGE 2

DETAIL SHEET

TITLE: (U) Bag, Patient Holding and Evacuation, Prototype Design and Fabrication

FUNDING HISTORY: PY - 120 K; CY - 20K; BY - 38K

PROBLEM DEFINITION: The present means of protecting sick and injured personnel in cold environments from additional complications resulting from exposure to the cold is inadequate from the point of infliction through the evacuation system.

IMPORTANCE: Protection against exposure to cold must be provided through the evacuation organization until the patient can be moved by a temperature-controlled transportation medium or definitive treatment begins.

APPROACH: After problem definition, a number of proposals were evaluated before awarding a contract for prototype propane or propylene-fired heated liners to be placed inside medical evacuation bag. A second contract was awarded for prototypes of smaller, belt-mount versions of this system.

ACHIEVEMENTS: Functional problems encountered with the propane-fired heater unit have been assessed as nontrivial. The company which developed this equipment has gone out of business, which complicates the problem. Meanwhile, a Norwegian charcoal-fired heating unit has surfaced, and a specimen is being procured for evaluation.

RELATIONSHIP TO CORE PROGRAM: This task is consistent with the Laboratory's mission to develop medical field treatment and evacuation equipment.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) COMMERCE ;(U) SOURCES ;(U) FIELD CONDITIONS ;(U) MEDICAL EQUIPMENT ;(U) EYEGLASSES ;(U) KITS ;(U) ARMY PERSONNEL ;(U) EYE ;(U) REFRACTION (U) *OPHTHALMOLOGY ;(U) FIELD OPTOMETRY SET ;(U) OPTOMETRY ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY	Agency Accession: DA0A6230	Date of Summary: 01 OCT 81	REPORT CONTROL SYMBOL FHP24C

Date Prev Summary	Kind of Summary	Summary Scty	Work Security	Regrading	Distribution Instr	Specific Data Contractor Access	Level of Sum
01 OCT 80	D. CHANGE	U	U		NL	☒ YES ☐ NO	A. WORK UNIT

10. NO./CODES:*	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
Primary	64717A	3S464717D832	BA	C12
Contributing				
Contributing				

Title (Precede with Security Classification Code): (U) OPTOMETRY SET, FIELD, COMBAT

Scientific and Technological Areas: 009800 MED HOSP EQ 002400 BIOENGINEERING

Start Date	Estimated Completion Date	Funding Agency	Performance Method
MAY 74	SEP 82	DA	C. IN-HOUSE

Contract/Grant: Dates/Effective: Expiration: Number: Type: Amount: Kind of Award: F. CUM/TOT: $ 0

Resources Estimate		Professional Man Yrs	Funds (In Thousands)
Fiscal Year	Preceding 1981	2.0	$ 125
	Current 1982	0.1	$ 11

Responsible DOD Organization 407838 2406	Performing Organization 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB	NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701	ADDRESS: FT DETRICK MD 21701
RESPONSIBLE INDIVIDUAL	PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)
NAME: HAMES, W. H., LTC	NAME: ARNOLD, M.F.
TELEPHONE: 3016637277	TELEPHONE: 3016637237
	SOCIAL SECURITY ACCOUNT NUMBER
General Use	ASSOCIATE INVESTIGATORS
21A. B. C. D. E.	NAME: SALISBURY, L L
	NAME

Keywords (Precede EACH with Security Classification Code): (U) FIELD SET ;(U) FIELD OPTOMETRY ;(U) COMBAT SET ;(U) OPTOMETRY SET ;

23 Technical Objective, 24 Approach, 25 Progress (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO MODERNIZE AND UPDATE THE FIELD OPTOMETRY SET AND TO REPLACE COMPONENTS WHICH ARE NO LONGER AVAILABLE FROM COMMERCIAL SOURCES WITH NEW DESIGNS.

APPROACH: (U) DESIGN AND FABRICATION OF ENGINEERING DEVELOPMENT PROTOTYPES FOR DEVELOPING TESTING (DT II) AND OPERATIONAL TESTING (OT II).

PROGRESS: (U) 8010 - 8109. ALL COMPONENTS HAVE BEEN OBTAINED AND PACKAGED. A CHAIR WAS DESIGNED AROUND A 3 MEDICAL CHEST WITH REDUCED WEIGHT AND VOLUME. QT III WAS CONDUCTED DURING 4TH QUARTER FY 80 WITH NO MAJOR PROBLEMS. AWAITING TEST REPORT. QT III COMPLETED SUCCESSFULLY. RECOMMENDED FOR TYPE CLASSIFICATION. TECHNICAL DATA PACKAGE NEARING COMPLETION.

*Available to contractors upon originator's approval

PROCESSING DATE: 06 JAN 82

DETAIL SHEET

TITLE: (U) Optometry Set, Field, Combat

FUNDING HISTORY: PY - 108K; CY - 125K; BY - 57K

PROBLEM DEFINITION: To modernize and update the Field Optometry Set and to replace components which are no longer available from commercial sources with new designs.

IMPORTANCE: A functional optometry set is required for the use of optometry personnel assigned to the medical battalion providing division level medical support and other teams providing optometry services.

APPROACH: To design and evaluate engineering prototypes for test, technical data packages, and type classification.

ACHIEVEMENTS: The complete optometry set has successfully completed OT III. Final drawings are being produced for type classification.

RELATIONSHIP TO CORE PROGRAM: The Optometry Set is an integral part of the medical materiel program.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) CULICIDAE ;(U) COMMERCIAL AIRCRAFT ;(U) AIRCRAFT ;(U) AIRBORNE ;(U) SOLIDS;(U) RATES ;(U) OREGON;(U) INSECT CONTROL ;(U) HELICOPTERS ;(U) DISEASE VECTORS ;(U) DEPOSITION ;(U) UNITED STATES ;(U) *INSECTICIDES;(U) *PESTICIDES ;(U)

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

Agency Accession	Date of Summary	Report Control Symbol
DA0B6190	01 OCT 81	FHP24C

Date Prev Sum'ry	Kind of Summary	Summary Scty	Work Security	Regrading	Distribution Instr'n	Specific Data Contractor Access	Level of Sum
01 OCT 80	D CHANGE	U	U		NL	☒ Yes ☐ No	A. WORK UNIT

No./Codes *	Program Element	Project Number	Task Area Number	Work Unit Number
Primary	64717A	3S464717D832	AA	014
Contributing				
Contributing				

Title (Precede with Security Classification Code): (U) PESTICIDE DISPERSAL UNIT, SOLID, HELICOPTER SLUNG

Scientific and Technological Areas: 009800 MED HOSP EQ 002400 BIOENGINEERING

Start Date	Estimated Completion Date	Funding Agency	Performance Method
OCT 76	SEP 82	DA	C. IN-HOUSE

Contract/Grant: a. Dates/Effective: Expiration: b. Number: c. Type: d. Amount: e. Kind of Award: f. CUM/TOT: $ 0

Resources Estimate		a. Professional Man Yrs	b. Funds (In Thousands)
Fiscal Year	Preceding 1981	1.5	$ 125
	Current 1982	1.0	$ 57

Responsible DOD Organization	Performing Organization
407838 2406	407838 2406
Name: MDRDC MEDICAL BIOENGINEERING R&D LAB	Name: MDRDC MEDICAL BIOENGINEERING R&D LAB
Address: FT DETRICK MD 21701	Address: FT DETRICK MD 21701
Responsible Individual — Name: HAMES, W. H., LTC; Telephone: 3016637277	Principal Investigator — Name: PIERCE, P. E.; Telephone: 3016637237; Social Security Account Number:
General Use: 21A. B. C. D. E.	Associate Investigators — Name: REAMS, W.H.; Name: NELSON, J.H.

Keywords (Precede EACH with Security Classification Code): (U) HELICOPTER RIG ;(U) SOLID DISPERSAL ;(U) AERIAL APPLICATIONS ;(U) MOSQUITO CONTROL ;(U) SOLID INSECTICIDE ;

23. Technical Objective 24. Approach 25. Progress (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code.)

OBJECTIVE:(U) TO IDENTIFY A SUITABLE COMMERCIAL, HELICOPTER SLUNG, DISPERSAL UNIT FOR APPLYING SOLID FORMULATIONS OF INSECTICIDES, WHICH WOULD- (A) BE CAPABLE OF DISPERSING INSECTICIDES WHEN SLUNG BENEATH A HELICOPTER- (B) REQUIRE NO MODIFICATION OF THE AIRCRAFT- (C) BE CAPABLE OF APPLYING ADEQUATE SWATH WIDTHS AND DEPOSITION RATES FOR CONTROLLING DISEASE VECTORS IN COMBAT SITUATIONS OR CONUS.

APPROACH: (U) A SIMPLEX SPREADER WAS EVALUATED WITH VARIOUS PESTICIDE FORMULATIONS UNDER A VARIETY OF CONDITIONS AND WAS FOUND TO BE UNSATISFACTORY DUE LARGELY TO THE VERTICALLY ACTUATED GATE SYSTEM. A CHADWICK, INC. APPLICATOR, WITH HORIZONTALLY ACTUATED GATE SYSTEM, WAS PROCURED AND MODIFIED FOR REMOTE CONTROL OPERATION. FEASIBILITY AND MILITARY ADAPTABILITY WILL BE ESTABLISHED UNDER FIELD CONDITIONS.

PROGRESS: (U) 8010 - 8109. DEVELOPMENTAL TESTING II AND OPERATIONAL TESTING II COMPLETED WITH SATISFACTORY COMPLETION OF ALL TEST CRITERIA. ANTICIPATE TYPE CLASSIFICATION IN THE 3RD QUARTER FY82.

*Available to contractors upon originator's approval

PROCESSING DATE: 08 JAN 82

DETAIL SHEET

TITLE: (U) Pesticide Dispersal Unit, Solid, Helicopter Slung

FUNDING HISTORY: PY - 26; CY - 125K; BY - 57K

PROBLEM DEFINITION: To adapt a commercial item capable of dispensing solid pesticide formulations for use in the military operation environment.

IMPORTANCE: Medical personnel engaged in field operations need the capacity for aerial dispersal of solid pesticide formulations to ensure rapid treatment of large areas inaccesible by ground equipment but too small for efficient use of larger aerial dispersal equipment. Currently, field units have no item of equipment with the capability, although their mission and TOE require it.

APPROACH: A commercially available spreader which is slung beneath a helicopter on the helicopter's cargo hook is being adapted for military use.

ACHIEVEMENTS: Developmental and operational testing have been completed. Work on the hardware is completed. Tasks remaining to be accomplished involve Basis of Issue and MOS decisions which must be approved by the Department of the Army prior to type classification.

RELATIONSHIP TO CORE PROGRAM: Project involves evaluation and modification of commercial unit as a military standard item. Item will replace current obsolete standard TOE item. Project is in concert with pest control equipment program.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) FIELD EQUIPMENT ;(U) URETHANES ;(U) SUPPLIES ;(U) PROTECTION ;(U) CONFINED ENVIRONMENTS ;(U) ENVIRONMENTS;(U) FIELD CONDITIONS ;(U) *ARCTIC REGIONS ;(U) *CONTAINERS ;(U) *ENVIRONMENTAL PROTECTION;(U) *MEDICAL SUPPLIES ;(U)

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

Agency Accession: DAOA6290 | Date of Summary: 01 OCT 81 | Report Control Symbol: FHP24C

Date Prev Sum'ry: 01 OCT 80 | Kind of Summary: D. CHANGE | Summary Scty: U | Work Security: U | Regrading: | Distribution Instr: NL | Specific Data-Contractor Access: [X] YES [ ] NO | Level of Sum: A. WORK UNIT

NO./CODES *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
PRIMARY	64717A	3S464717D832	BB	015
CONTRIBUTING				
CONTRIBUTING				

Title (Precede with Security Classification Code): (U) ENVIRONMENTAL PROTECTION CONTAINERS FOR MEDICAL SUPPLIES

Scientific and Technological Areas: 009800 MED HOSP EQ 002400 BIOENGINEERING

Start Date: SEP 74 | Estimated Completion Date: SEP 82 | Funding Agency: DA | Performance Method: C. IN-HOUSE

Contract/Grant: Dates/Effective: Expiration: Number: Type: Amount: Kind of Award: F. CUM/TOT: $ 0

Resources Estimate		Professional Man Yrs	Funds (In Thousands)
Fiscal Year	Preceding 1981	0.4	$ 22
	Current 1982	0.7	$ 43

Responsible DOD Organization: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

Responsible Individual

NAME: HAMES, W. H., LTC

TELEPHONE: 3016637277

Performing Organization: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

Principal Investigator (Furnish SSAN if U.S. Academic Institution)

NAME: CONWAY, W.H.

TELEPHONE: 3016637237

Social Security Account Number

Associate Investigators

NAME: PATZER, N.H.

NAME

General Use: 21A. B. C. D. E.

Keywords (Precede EACH with Security Classification Code): (U) ENVIRONMENTAL CONTAINER ;(U) FIELD CONTAINER ;(U) ARCTIC FIELD CONTAINER ;(U) MEDICAL SUPPLY CONTAINER;(U) ARCTIC SUPPLIES ;(U) ARCTIC

Technical Objective, Approach, Progress (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code.)

OBJECTIVE:(U) TO DEVELOP A CONTAINER TO PROTECT FREEZABLE MILITARY MEDICAL ITEMS IN AN ARCTIC ENVIRONMENT.

APPROACH: (U) DESIGN, FABRICATE AND EVALUATE A CONTAINER TO MEET THE REQUIREMENTS OF ARCTIC USE.

PROGRESS: (U) 8010 - 8109. MODIFICATIONS REQUIRED TO PROTOTYPE AS A RESULT OF MAINTENANCE EVALUATION MADE REFABRICATION OF PROTOTYPE EQUIPMENT DESIRABLE TO PROVE MANUFACTURABILITY. THIS EFFORT IS UNDERWAY BUT HAS BEEN DELAYED DUE TO BUDGET CONSTRAINTS AND PROCUREMENT PROBLEMS WITH SOME OF THE PARTS INVOLVED.

*Available to contractors upon originator's approval

PROCESSING DATE: 28 FEB 82

DETAIL SHEET

TITLE: (U) Environmental Protection Containers for Medical Supplies

FUNDING HISTORY: PY - 62K; CY - 22K; BY - 43K

PROBLEM DEFINITION: To provide a means of storing biologicals which are subject to damage by freezing during field operations in arctic or subarctic regions.

IMPORTANCE: The present lack of a dedicated piece of equipment to cope with this problem has led to spoilage of large quantities of biological materials in Alaska. Present methods of preserving freezables are makeshift and totally inadequate.

APPROACH: To develop a light-weight, insulated chest that includes electrical strip heaters and a temperature control circuit. This chest, issued to appropriate field units, would be dedicated to the storage and preservation of freezable medical materials. The chest is also to be designed to protect freezables during several hours of unpowered transport.

ACHIEVEMENTS: Modifications required to the prototype as a result of maintenance evaluation have made it desirable to refabricate the prototype. That effort is under way.

RELATIONSHIP TO CORE PROGRAM: This equipment performs an ancillary function related to medical treatment in a field environment. The development of field treatment is a primary function of this research area.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
[illegible]	81 10 01	CSTR&E AR-636

3. PERFORMANCE	4. KIND OF SUMMARY	5. WORK SECURITY	6. WORK SECURITY	7. DISADVANCE	8. GOVERNMENT	8b. SPECIFIC DATA CONTRACTOR ACCESS	9. LEVEL OF SUM
1 [illegible]	P. TERMINATION U	C			MI	☒ YES ☐ NO	A. WORK UNIT

10. NSN CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	64717A	3S464717D832	CA	017 APC E567
b. CONTRIBUTING				
c. CONTRIBUTING	CARDS NO: 14238			

11. TITLE (Include Security Classification Code)

(U) Urine and Stool Unit, Dental Operating, Field

12. SCIENTIFIC AND TECHNOLOGICAL AREAS

007800 Life Support; 009800 Medical and Hospital Equipment;

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
Prior	8109	DAI	C. In-House

17. CONTRACT GRANT

a. DATES/EFFECTIVE: EXPIRATION:
b. NUMBER:
c. TYPE: d. AMOUNT:
e. KIND OF FUNDS: f. CUM. AMT.

18. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (In thousands)
FISCAL YEAR PRECEDING 81	0.1	17
FISCAL YEAR CURRENT 82	0.0	00

19. RESPONSIBLE DOD ORGANIZATION

NAME: US Army Medical Bioengineering Research & Development Laboratory
ADDRESS: Fort Detrick, Frederick, MD 21701

RESPONSIBLE INDIVIDUAL
NAME: Ramos, W.M., LTC
TELEPHONE: (301) 663-7277; AUTOVON 343-7277

21. GENERAL USE

Foreign Intelligence Not Applicable

20. PERFORMING ORGANIZATION

NAME: US Army Medical Bioengineering Research & Development Laboratory
ADDRESS: Fort Detrick, Frederick, MD 21701

PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)
NAME: Malek, J.W.
TELEPHONE: (301) 663-7277; AUTOVON 343-7277
SOCIAL SECURITY ACCOUNT NUMBER:

ASSOCIATE INVESTIGATORS
NAME:
NAME:

POC:DA

22. KEYWORDS (Precede EACH with Security Classification Code)

(U) Dental Chair; (U) Dental Operating; (U) Portable Chair; (U) Field Dental Chair

23. TECHNICAL OBJECTIVE. 24. APPROACH 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code.)

23. (U) To design and fabricate a new portable dental operating chair for Army field use, incorporating lightweight materials.

24. (U) Design, fabricate, and evaluate a suitable chair.

25. (U) 8010 - 8109. Supplemental to testing was conducted at Fort Carson, CO, from 30 September to 13 November 1980. Conclusions reached after this test was that the prototype did not meet the characteristics. At an IPR held 1 September 1981, the recommended course of action was to discontinue further developmental effort.

DA FORM 1498 [illegible] DD FORM 1498 [illegible] DU.S. GPO [illegible]

DETAIL SHEET

[illegible] Chair and Stool Unit, Dental Operating, Field

[illegible] MIS-0[illegible]: FY - 85K, FY - [illegible], BY - 0

DESCRIPTION: A need exists to replace the current Chair and Stool Unit, Dental Operating, Portable (NSN 6520-00-181-7349) with an item that will provide essentially the same physical/operational capabilities but that will be less costly, require less maintenance/repair support, be lighter in weight, and require less storage/transportation space.

JUSTIFICATION: The current standard chair and stool unit has become extremely [illegible] to procure. The current estimated cost (from one response only) has tripled since the standard item was placed into the supply system. In addition, the combat readiness and reliability of the chair is low, primarily due to the high repair rate to correct malfunctions of the hydraulic control system. Transportability is difficult because the weight and bulk exceed the transportability for the normal two-person user team.

APPROACH: Review of possible commercial sources revealed that none met the characteristics established by the Letter Requirement (LR). A design and fabrication were accomplished by an in-house effort.

ACCOMPLISHMENTS: Prototype subjected to additional development testing (DT IIA) and another maintenance evaluation by USAMMA. Both were successfully concluded. In June 1980, prototype forwarded to the 4th Mechanized Infantry Division, Fort Carson, CO, for operational testing (OT IIa). Testing was initiated on 30 September 1980.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) FIELD EQUIPMENT ;(U) FIELD CONDITIONS ;(U) WORK ;(U) SOURCES ;(U) PHOTOGRAPHIC PROCESSORS ,(U) PHOTOGRAPHIC FILM ;(U) MEDICAL SERVICES ;(U) INDUSTRIES

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				DA0B6249	01 OCT 81	REPORT CONTROL SYMBOL FHP24C
1. DATE PREV SUM BY: 01 OCT 80	2. KIND OF SUMMARY: D. CHANGE	3. SUMMARY SCTY: U	4. WORK SECURITY: U	5. HANDLING:	6a. DISTRIBUTION INSTR: NL	6b. SPECIFIC DATA - CONTRACTOR ACCESS: [X] YES [ ] NO	7. LEVEL OF SUM: A. WORK UNIT
10. NO./CODES:*	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER			
a. SUMMARY	64717A	3S464717D832	BA	041			
b. CONTRIBUTING							
c. CONTRIBUTING							

11. TITLE (Precede with Security Classification Code)

(U) LOW CAPACITY RADIOGRAPHIC SYSTEM, FIELD

12. SCIENTIFIC AND TECHNOLOGICAL AREAS:

003500 CLIN MEDICINE 009800 MED HOSP EQ

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
JAN 79	SEP 83	DA	C. IN-HOUSE

17. CONTRACT/GRANT:

a. DATE EFFECTIVE: EXPIRATION:

b. NUMBER:

c. TYPE: d. AMOUNT:

e. GOVT AWARD: F. CUM/TOT: $ 0

18. RESPONSIBLE DOD ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

RESPONSIBLE INDIVIDUAL

NAME: HAMES, W. H., LTC

TELEPHONE: 3016637277

GENERAL USE

21A B. C. D. E.

19. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
PRECEDING FY: 1981	0.2	$ 6
CURRENT FY: 1982	0.1	$ 22

20. PERFORMING ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)

NAME: SALISBURY, L L

TELEPHONE: 3016637237

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME

NAME

22. KEYWORDS (Precede EACH with Security Classification Code)

(U) X-RAY ;(U) FIELD MEDICINE ;(U) FIELD EQUIPMENT ;

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO IDENTIFY SUITABLE LOW CAPACITY RADIOGRAPHIC SYSTEM TO INCLUDE FILM PROCESSOR(S) AND COMPATIBLE FILM(S), CASSETTES AND OTHER OPERATING ACCESSORIES FOR AMEDD USAGE (EXCEPT DENTAL).

APPROACH: (U) SEARCH EXISTING INDUSTRIAL SOURCES FOR FUNCTIONAL DEVICES THAT CAN BE ADOPTED. IF NONE ARE AVAILABLE, MODIFY, DESIGN OR CONTRACT FOR THE DESIGN OF NEW DEVICES.

PROGRESS: (U) 8010 - 8109. A SURVEY OF COMMERCIAL PROCESSING UNITS WAS MADE. NONE SHOULD SATISFY THE LETTER REQUIREMENT. A WET PROCESSOR ASSEMBLED BY A COMMERCIAL MANUFACTURER AND A DRY PROCESSOR USING POLAROID TYPE FILM WERE EVALUATED AND SUBMITTED FOR OPERATIONAL TESTING. TEST RESULTS INDICATE THE WET PROCESSOR IS UNSUITABLE FOR FIELD USE AND THE DRY UNITS WILL PROVIDE USABLE FILMS. A SURVEY OF COMMERCIAL X-RAY DEVICES HAS BEEN MADE. IT WAS DECIDED AT AN IPR 1ST QUARTER FY81 THAT NO COMMERCIAL RADIOGRAPHIC SYSTEM WOULD SATISFY THE REQUIREMENTS OF FIELD UNIT AND A DEVELOPMENT CONTRACT SHOULD BE LET. IT WAS ALSO DECIDED TO REPAIR THE DRY PROCESSOR CURRENTLY IN THE INVENTORY.

*Available to contractors upon originator's approval

PROCESSING DATE: 30 NOV 81

DD FORM MAY 68 1498M DTIC FORMAT 850 PAGE 20

DETAIL SHEET

TITLE: (U) Low Capacity Radiographic System, Field

FUNDING HISTORY: PY - 12K; CY - 6K; BY - 22K

PROBLEM DEFINITION: To identify suitable automatic film processors, compatible film, cassettes, and accessories for interfacing with a low capacity radiographic apparatus. To identify a suitable low capacity radiographic system for field medical use.

IMPORTANCE: Currently available wet X-ray film processors and accessories are not suitable for use by small medical units outside of field type hospitals based on weight, complexity, and utility requirements. The need is acute and critical for a film processor and a low capacity X-ray apparatus.

APPROACH: A survey of commercially available film processors and low capacity X-ray systems will be made to determine their ability to satisfy the letter requirement.

ACHIEVEMENTS: A market survey uncovered no commercial X-ray units that would meet the letter requirements. A request for proposals is being written for the commercial development of a low capacity X-ray system.

RELATIONSHIP TO CORE PROGRAM: This program is directly related to the Laboratory's mission of developing field medical equipment.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) FIELD CONDITIONS ;(U) COMMERCE ;(U) WORK ;(U) SOURCES ;(U) MEDICAL SERVICES ;(U) MAINTAINABILITY ;(U) FIELD EQUIPMENT ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 AGENCY ACCESSION	2 DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA086250	01 OCT 81	FHP24C

3 PREV. SUM. DATE	4 KIND OF SUMMARY	5 SUMMARY SEC'Y	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION INSTR	8b SPECIFIC DATA	9 LEVEL OF SUM
01 OCT 80	D CHANGE	U	U		NL	[X] CONTRACTOR ACCESS YES [ ] NO	A. WORK UNIT

10 NO./CODES *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a PRIMARY	64717A	3S464717D832	BA	042
b CONTRIB. NO.				
c CONTRIB. NO.				

11 TITLE (Precede with Security Classification Code) *

(U) HIGH CAPACITY RADIOGRAPHIC SYSTEM, FIELD

12 SCIENTIFIC AND TECHNOLOGICAL AREAS *

003500 CLIN MEDICINE 009800 MED HOSP EQ

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY	16 PERFORMANCE METHOD
FEB 79	SEP 83	DA	C. IN-HOUSE

17 CONTRACT/GRANT

a DATES EFFECTIVE
EXPIRATION
b NUMBER *
c TYPE
d AMOUNT
e KIND OF AWARD
F. CUM/TOT: $ 0

18 RESOURCES ESTIMATE	a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
FISCAL YEAR PRECEDING 1981	1.0	$ 78
FISCAL YEAR CURRENT 1982	2.2	$ 194

19 RESPONSIBLE DOD ORGANIZATION 407838 2406

NAME * MDRDC MEDICAL BIOENGINEERING R&D LAB

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RESPONSIBLE INDIVIDUAL

NAME HAMES, W. H., LTC

TELEPHONE 3016637277

20 PERFORMING ORGANIZATION 407838 2406

NAME * MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS * FT DETRICK MD 21701

PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)

NAME SALISBURY, L L

TELEPHONE 3016637237

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME

NAME

21 GENERAL USE

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code)

(U) X-RAY ;(U) FIELD MEDICINE ;(U) FIELD EQUIPMENT ;

23 TECHNICAL OBJECTIVE * 24 APPROACH 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO IDENTIFY AND EVALUATE A REPLACEMENT FIELD X-RAY SYSTEM FOR THE CURRENT STANDARD (100 MA AND 200 MA) SYSTEM WHICH IS INADEQUATE IN RELIABILITY, AVAILABILITY AND MAINTAINABILITY.

APPROACH: (U) SEARCH EXISTING COMMERCIAL SOURCES FOR FUNCTIONAL COMPONENTS (X-RAY SOURCE, TABLE, POWER SUPPLIES, FILM PROCESSORS) THAT CAN BE ADOPTED. IF NONE ARE AVAILABLE, MODIFY, DESIGN OR CONTRACT FOR DESIGN OF NEW DEVICES.

PROGRESS: (U) 8010 - 8109 A SURVEY OF THE COMMERCIAL MARKET WAS MADE. NO COMMERCIAL UNIT WOULD SATISFY THE LETTER REQUIREMENTS. A COMMERCIAL X-RAY SOURCE, CONTROLLER AND POWER SUPPLY HAS BEEN MODIFIED TO FIT THE ARMY FIELD TABLE. THIS COMBINATION UNDERWENT OPERATIONAL TESTING I DURING 4TH QUARTER FY80 AND 1ST QUARTER FY 81. OF THE 16 CRITICAL ISSUES, 10 WERE SATISFIED AND 4 PARTIALLY SATISFIED. A REDESIGN IS UNDERWAY. OPERATIONAL TEST II IS SCHEDULED FOR 3RD QUARTER FY82.

*Available to contractors upon originators approval

PROCESSING DATE: 06 JAN 82

DD FORM 1 MAY 80 1498M DTIC FORMAT 850 PAGE 21

DETAIL SHEET

TITLE: (U) High Capacity Radiographic System, Field

FUNDING HISTORY: PY - 222K; CY - 78K; BY - 194K

PROBLEM DEFINITION: The current field radiographic system is inadequate in reliability, availability, maintainability and does not conform to the radiation requirements of 21 CFR.

IMPORTANCE: The lack of a working, reliable, certifiable, high capacity X-ray system to meet the radiological requirements of field medical treatment facilities has a significant impact on the ability of these activities to provide basic health care. The need is acute and critical.

APPROACH: A search of commercial sources will be made for a functional system or components that can be combined into a system that will meet the field requirements.

ACHIEVEMENTS: A survey was made of the commercial market. No commercial system was found that will meet the letter requirement. Commercially available components have been obtained and have been adapted and modified into a radiological system compatible with field requirements. This system is composed of a commercial control unit, transformer, X-ray source, and image intensifier system. These items have been matched to the Army 5090 field table. Film processing is provided by using a commercial wet processor with a daylight loader and a water recycling system. The system underwent operational testing during 1st Q FY 81. Of the 16 critical issues, 10 were satisfied fully and 4 partially. A redesign is under way.

RELATIONSHIP TO CORE PROGRAM: This program is directly related to the Laboratory's mission of developing field medical equipment.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) SPINAL COLUMN ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

AGENCY ACCESSION: DA086252	2. DATE OF SUMMARY: 30 SEP 81	REPORT CONTROL SYMBOL: FHK53E					
3. DATE PREV SUM RY: 01 JUL 81	4. KIND OF SUMMARY: K. COMPLETION	5. SUMMARY SCTY: U	6. WORK SECURITY: U	7. REGRADING:	8. DISTRIBUTION INSTR: NL	8a. SPECIFIC DATA: CONTRACTOR ACCESS YES ☒ NO ☐	9. LEVEL OF SUM: A. WORK UNIT
10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER			
a. PRIMARY:	64717A	3S464717D832	BB	043			
b. CONTRIBUTING:							
c. CONTRIBUTING:							

d. (Precede with Security Classification Code): (U LITTERBOARD

11. SCIENTIFIC AND TECHNOLOGICAL AREAS: 009800 MED HOSP EQ 002400 BIOENGINEERING

12. START DATE	13. ESTIMATED COMPLETION DATE	14. FUNDING AGENCY	16. PERFORMANCE METHOD
JAN 79	JUN 81	DA	C. IN-HOUSE

17. CONTRACT/GRANT
a. DATES EFFECTIVE: EXPIRATION:
b. NUMBER:
c. TYPE: d. AMOUNT:
e. KIND OF AWARD: F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	c. FUNDS (In Thousands)
FISCAL YEAR PRECEDING 1981	0.0	$ 15
FISCAL YEAR CURRENT 1982	0.0	$ 0

19. RESPONSIBLE DOD ORGANIZATION: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701
RESPONSIBLE INDIVIDUAL
NAME: AMES, W. H., LTC
TELEPHONE: 3016637277

20. PERFORMING ORGANIZATION: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701
PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)
NAME: O'CONNOR, R J
TELEPHONE: 3016637237
SOCIAL SECURITY ACCOUNT NUMBER
ASSOCIATE INVESTIGATORS
NAME: CONWAY, W H
NAME:

21. GENERAL USE
21A. B. C. D. E.

22. KEYWORDS (Precede EACH with Security Classification Code): (U) LITTER;(U) PATIENTS, TRANSPORTATION OF ;(U) INJURIES OF SPINE, BACK, CERVICAL ;

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code):

OBJECTIVE:(U) A NEED EXISTS FOR A RIGID DEVICE ON WHICH TO TRANSPORT PATIENTS WITH SPINE AND/OR CERVICAL SPINE DAMAGE FROM INJURY SITE TO A MEDICAL FACILITY.

APPROACH: (U) COMMERCIALLY AVAILABLE SPINEBOARDS (LITTERBOARDS) WILL BE EVALUATED FOR ADOPTION AND/OR MODIFICATION TO FIT MILITARY REQUIREMENTS.

PROGRESS: (U) 8010 - 8109. WORK UNIT COMPLETED. REVISED DRAWINGS AND A PROPOSED SPECIFICATION HAVE BEEN FORWARDED TO DPSC FOR PROCUREMENT ACTION.

*Available to contractors upon originators approval

PROCESSING DATE: 08 JAN 82

DD FORM 1 MAY 68 1498M DTIC FORMAT 850

DETAIL SHEET

TITLE: (U) Litterboard

FUNDING HISTORY: PY - 76K; CY - 15K; BY - 0

PROBLEM DEFINITION: Litters available for use in a field environment are not sufficiently rigid for the proper management of back or cervical spine injuries. There is a need for a rigid litterboard/spineboard in the supply system for proper casualty management. The advice to fabricate locally, given in FM 8-35, has proven inadequate.

IMPORTANCE: The use of spineboards/litterboards in the proper management of back and cervical spine injuries is essential to sound medical treatment in the field to minimize the chance of further injury during transport.

APPROACH: The commercial market for these devices and accessories was searched both by advertisement in Commerce Business Daily and by letter to potential vendors. Characteristics of commercial items as well as in-house development will be evaluated against field requirements. It is hoped that a commercial device will adequately meet this need.

ACHIEVEMENTS: Work unit was completed with the technical data package forwarded to DPSC for procurement.

RELATIONSHIP TO CORE PROGRAM: The effective management of back and cervical spine injuries using litterboards/spineboards is consistent with the Laboratory's mission for field medical equipment development, as well as the overall mission of The Surgeon General to provide the best medical treatment consistent with field experiences.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) FIELD TESTS ;(U) DISEASE VECTORS ;(U) CULICIDAE ;(U) ALTERNATING CURRENT ;(U) WORK ;(U) TRAPS ;(U) SURVEYS ;(U) POWER SUPPLIES ;(U) POPULATION (U) PESTS ;(U) LIGHT ;(U) INSTALLATION

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 AGENCY ACCESSION	2 DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0G0701	01 OCT 81	FHP24C

3 DATE PREV SUMRY	4 KIND OF SUMMARY	5 SUMMARY SCTY	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION INSTR	8b SPECIFIC DATA	9 LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	[X] CONTRACTOR ACCESS YES [ ] NO	A. WORK UNIT

10 NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a PRIMARY	64717A	3S464717D832	AA	044
b CONTRIBUTING				
c CONTRIBUTING				

11 TITLE (Precede with Security Classification Code)

(U) TRAP, MOSQUITO, LIGHT, COLLAPSIBLE

12 SCIENTIFIC AND TECHNOLOGICAL AREAS

009800 MED HOSP EQ 002400 BIOENGINEERING 005900 ENVIR BI

13 START DATE	13 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY	16 PERFORMANCE METHOD
OCT 79	SEP 82	DA	C. IN-HOUSE

17 CONTRACT/GRANT

a DATES EFFECTIVE — EXPIRATION

b NUMBER *

c TYPE — d AMOUNT

e KIND OF AWARD — f CUM/TOT: $ 0

18 RESOURCES ESTIMATE		a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	0.2	$ 10
	CURRENT 1982	1.7	$ 37

19 RESPONSIBLE DOD ORGANIZATION — 407838 2406

NAME * MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS * FT DETRICK MD 21701

RESPONSIBLE INDIVIDUAL

NAME HAMES, W. H., LTC

TELEPHONE 3016637277

20 PERFORMING ORGANIZATION — 407838 2406

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PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)

NAME PIERCE, P. E.

TELEPHONE 3016637237

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME O'CONNOR, R.J.

NAME FROMMER, F

21 GENERAL USE

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code)

(U) MOSQUITO LIGHT TRAP ;(U) DISEASE VECTORS ;(U) PEST MOSQUITOES ;(U) MOSQUITO SURVEYS ;(U) POPULATION STUDIES;

23 TECHNICAL OBJECTIVE, 24 APPROACH, 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO DEVELOP A COLLAPSIBLE MOSQUITO LIGHT TRAP WHICH IS POWERED SOLELY FROM AC SOURCES. THE TRAP WILL BE USED AT FIXED INSTALLATIONS AND STATIC DEPLOYMENT IN DISEASE VECTOR AND PEST MOSQUITO SURVEYS. THIS WILL REPLACE THE STANDARD MOSQUITO LIGHT TRAP (NSN 3740-00-607-0337, LIN X 24251) WHICH HAS PROVEN BULKY AND UNRELIABLE FOR FIELD USE.

APPROACH: (U) DESIGN AND FABRICATE A SUITABLE COLLAPSIBLE, AC POWERED, MOSQUITO LIGHT TRAP AND CONDUCT FIELD EVALUATIONS IN VARIOUS HABITATS.

PROGRESS: (U) 8010 - 8109. EXPERIMENTAL PROTOTYPES HAVE BEEN CONSTRUCTED WHICH ARE CAPABLE OF OPERATING ON 120 AC POWER AND USE A FLUORESCENT BULB AS THE LIGHT SOURCE. FOR STORAGE, THE TRAP IS COLLAPSIBLE TO LESS THAN 2.5 CUBIC FEET.

* Available to contractors upon originators approval

PROCESSING DATE: 30 NOV 81

DD FORM 1498M MAY 68 DTIC FORMAT 850

DETAIL SHEET

TITLE: (U) Trap, Mosquito, Light, Collapsible

FUNDING HISTORY: PY - 9K; CY - 10K; BY - 37K

PROBLEM DEFINITION: To develop an improved replacement for the Trap, Mosquito, Light (NSN 3740-00-607-0337) that is collapsible for storage, is capable of using a variety of lamps, and has an extended service life.

IMPORTANCE: The Trap, Mosquito, Light is a bulky, heavy item which is part of the TOE of the Preventive Medicine Detachment, Team LA, Entomology Services (TOE 8-620H0LA). It is an important instrument for surveillance of medically important insects in areas of static troop deployment where surveys are continued for prolonged lengths of time. This trap will provide long-term information on the control efforts of an IPM program.

APPROACH: A new collapsible, AC powered light trap will be fabricated in-house. The primary objective is to produce a durable trap that can be easily disassembled and collapsed for storage and shipment

ACHIEVEMENTS: Initial prototyptes have been constructed.

RELATIONSHIP TO CORE PROGRAM: Project involves development of a new replacement trap for one currently used by field medical units.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) AEROSOL GENERATORS;(U) DISEASE VECTORS ;(U) CULICIDAE ;(U) WARFARE ;(U) UNITED STATES ;(U) PREVENTIVE MEDICINE ;(U) INSECT CONTROL ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

Agency accession	DA0G0700
Date of summary	01 OCT 81
Report control symbol	FHP24C
Date prev summary	01 OCT 80
Kind of summary	D. CHANGE
Summary scty	U
Work security	U
Regrading	
Distribution instr	NL
Specific data contractor access	[X] YES [ ] NO
Level of sum	A. WORK UNIT

No./Codes	Program Element	Project Number	Task Area Number	Work Unit Number
a. Primary	64717A	3S464717D832	AA	045
b. Contributing				
c. Contributing				

Title: (U) AEROSOL GENERATOR, ULV, SKID MOUNTED

Scientific and technological areas: 009800 MED HOSP EQ 002400 BIOENGINEERING

Start date	OCT 79
Estimated completion date	SEP 32
Funding agency	DA
Performance method	C. IN-HOUSE

Contract/Grant: a. Dates/Effective; Expiration; b. Number; c. Type; d. Amount; e. Kind of award; F. CUM/TOT: $ 0

Resources Estimate		a. Professional Man Yrs	b. Funds (In Thousands)
Fiscal Year — Preceding	1981	0.6	$ 46
Fiscal Year — Current	1982	0.3	$ 11

Responsible DOD organization: 407838 2406

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RESPONSIBLE INDIVIDUAL

NAME: HAMES, W. H., LTC

TELEPHONE: 3016637277

Performing organization: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

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PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)

NAME: PIERCE, P. E.

TELEPHONE: 3016637237

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME: NELSON, JH

NAME: REAMS, W.H.

General use: 21A. B. C. D. E.

Keywords (Precede EACH with Security Classification Code): (U) AEROSOL GENERATOR ;(U) ULV DISPERSAL ;(U) MOSQUITO CONTROL ;(U) SKID MOUNTED;(U) DURABLE ;(U) DISEASE VECTOR ;

Technical objective, approach, progress (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code.)

OBJECTIVE:(U) TO IDENTIFY AND EVALUATE A COMMERCIALLY AVAILABLE, SKID MOUNTED, ULV AEROSOL GENERATOR CAPABLE OF DISPERSING ALL ULV INSECTICIDE FORMULATIONS REGISTERED FOR MOSQUITOES. THIS GENERATOR WOULD BE USED BY PREVENTIVE MEDICINE AND ENGINEERING, PERSONNEL IN COMBAT ZONES AND CONUS FOR CONTROLLING DISEASE VECTORS AND PEST ARTHROPODS.

APPROACH: (U) A REVIEW OF COMMERCIALLY AVAILABLE ULV AEROSOL GENERATORS WILL BE MADE. SUITABLE UNITS WILL BE FIELD EVALUATED. FINAL SELECTION OF SPECIFICATION CHARACTERISTICS WAS MADE AFTER FORMAL TESTING COORDINATED WITH RESPONSIBLE AGENCIES.

PROGRESS: (U) 8010 - 8109. IPR RECOMMENDED TYPE CLASSIFICATION OF AEROSOL GENERATOR. EQUIPMENT WILL BE TRANSITIONED DURING EARLY FY82.

PROCESSING DATE: 30 NOV 81

DETAIL SHEET

TITLE: (U) Aerosol Generator, ULV, Skid-Mounted

FUNDING HISTORY: PY - 10K; CY - 46K; BY - 11K

PROBLEM DEFINITION: To evaluate and recommend for adoption into TOE's an ULV aerosol generator to replace current cold fog generators.

IMPORTANCE: Since 1960 commercial pest control has used the environmentally acceptable methods of ULV aerosol generator for adult mosquito control. In this area, the military has not maintained state-of-the-art. Adoption of these generators will provide the TOE units the capabilities to control adult mosquitoes using ultra-low volume techniques.

APPROACH: Commercial units of a high-air volume, low-air pressure design will be evaluated both functionally and operationally. Results will be used as the basis for procurement of aerosol generators.

ACHIEVEMENTS: All DT and OT in these units have been successfully completed. Project has met all criteria for type classification.

RELATIONSHIP TO CORE PROGRAM: Project involves modernization of existing military pest control equipment to give field medical units modern, effective equipment.

MANUSCRIPT: Aerosol Generator, ULV, Skid Mounted, Kardatzke, Dr. James T., and Dr. James H. Nelson. Technical Report 8009.

(U) UNITED STATES ;(U) PREVENTIVE MEDICINE
(U) DISEASE VECTORS ;(U) *PESTICIDES ;(U) *INSECTICIDES;(U) LIQUIDS
(U) DISPERSING ;(U) DISPENSERS

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

AGENCY ACCESSION	DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA086193	01 OCT 81	FHP24C

KIND OF SUMMARY	SUMMARY SCTY	WORK SECURITY	REGRADING	DISTRIBUTION INSTR	SPECIFIC DATA CONTRACTOR ACCESS	LEVEL OF SUM
D. CHANGE	U	U		NL	[X] YES [ ] NO	A. WORK UNIT

PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
64717A	3S464717D832	AA	046

PESTICIDE DISPERSAL UNIT PORTABLE BACKPACK

SCIENTIFIC AND TECH AREAS: 002400 BIOENGINEERING

ESTIMATED COMPLETION DATE: SEP 82

FUNDING AGENCY: DA

PERFORMANCE METHOD: C. IN-HOUSE

RESOURCES ESTIMATE		a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	0.1	$ 4
	CURRENT 1982	0.2	$ 4

RESPONSIBLE DOD ORGANIZATION: 407838 2406

BIOENGINEERING R&D LAB

MD 21701

PERFORMING ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)

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TELEPHONE: 3016637237

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME: O'CONNOR, R. J.

NAME

KEYWORDS: (U) BACKPACK ;(U) SOLID/LIQUID DISPERSAL ;(U) ARTHROPOD CONTROL ;(U) LIGHTWEIGHT ;(U) DURABLE ;(U) DISEASE VECTORS ;(U) PORTABLE ;

TECHNICAL OBJECTIVE, APPROACH, PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code.)

OBJECTIVE:(U) TO IDENTIFY A COMMERCIALLY AVAILABLE, LIGHTWEIGHT, DURABLE, BACKPACK UNIT CAPABLE OF DISPERSING SOLID OR LIQUID PESTICIDE FORMULATIONS. THIS UNIT WOULD BE USED BY PREVENTIVE MEDICINE PERSONNEL IN COMBAT ZONES AND CONUS FOR CONTROLLING DISEASE VECTORS AND PEST ARTHROPODS.

APPROACH:(U) A REVIEW OF COMMERCIALLY AVAILABLE BACKPACK UNITS WILL BE MADE. SUITABLE UNITS WILL BE FIELD EVALUATED. AFTER ENTOMOLOGICAL AND OPERATIONAL FEASIBILITY HAS BEEN DETERMINED, SUITABLE ITEM OF EQUIPMENT WILL BE SELECTED FOR NDI STRATEGY.

PROGRESS:(U) 8010 - 8109. DEVELOPMENTAL TESTING HAS BEEN ACCOMPLISHED ON 11 BACKPACK UNITS. NO FURTHER TESTING WAS DEEMED APPROPRIATE DURING FY81. MARKET SURVEY WILL BE CONDUCTED DURING 1ST QUARTER FY 82, AND IF NECESSARY, FURTHER DEVELOPMENTAL TESTING WILL FOLLOW. MATERIAL DEVELOPER WILL RECOMMEND USE OF A NDI STRATEGY DURING IPR TO BE HELD IN FY82

PROCESSING DATE: 30 NOV 81

DETAIL SHEET

TITLE: Pesticide Dispersal Unit, Portable, Backpack

FUNDING HISTORY: PY - 20K; CY - 4K; BY - 4K

PROBLEM DEFINITION: To evaluate and recommend adoption of a commercial motorized backpack unit that is capable of dispensing both liquid and solid pesticide formulations.

IMPORTANCE: An operational need exists for a motorized backpack unit that can dispense both liquid and solid pesticide formulations. The unit is needed to provide control during field operations in localized and remote areas where vehicular or aerial dispersal equipment cannot be used or is not readily available.

APPROACH: Available commercial backpack units will be evaluated from an engineering aspect to determine the best candidate units for operational evaluation. Selected units will be evaluated by an operational user to determine any unforeseen problems in deployment.

ACHIEVEMENTS: The concept of the backpack sprayer/duster was successfully proven during OT I conducted in October 1979. System is logistically supportable using existing logistic components.

RELATIONSHIP TO CORE PROGRAM: Project involves evaluation of commercial items for adoption as military standard items in medical TOE. Project is part of core program for pest control equipment development.

MANUSCRIPT: Engineering Evaluation of Commercial Backpack Sprayer/Dusters, Kardatzke, Dr. James T., Gula, Philip R., and Dr. James H. Nelson. For publication in Mosquito News.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) AIRCRAFT ;(U) CULICIDAE ;(U) COMMERCIAL AIRCRAFT ;(U) UNITED STATES ;(U) RATES ;(U) LIQUIDS ;(U) INSECT CONTROL ;(U) HELICOPTERS ;(U) DISEASE VECTORS ;(U) DEPOSITION ;(U) *INSECTICIDES;(U) *DISPERSING ;(U) *AERIAL SPRAYING ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				AGENCY ACCESSION: DA086195		2 DATE OF SUMMARY: 01 OCT 81		REPORT CONTROL SYMBOL: FHP24C
1 DATE PREV SUMM: 01 OCT 80	4 KIND OF SUMMARY: D. CHANGE	5 SUMMARY SCTY: U	6 WORK SECURITY: U	7 REGRADING	8a DISTRIBUTION INSTR: NL	8b SPECIFIC DATA: CONTRACTOR ACCESS YES [X] NO [ ]		9 LEVEL OF SUM: A. WORK UNIT
10 NO./CODES:*	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER		
a PRIMARY	64717A	3S464717D832		AA		047		
b SECONDARY								
c CONTRIBUTING								

11 TITLE (Type in parens with Security Classification Code):

(U) PESTICIDE DISPERSAL UNIT, LIQUID, HELICOPTER SLUNG

12 SCIENTIFIC AND TECHNOLOGICAL AREAS:

009800 MED HOSP EQ 002400 BIOENGINEERING

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY		16 PERFORMANCE METHOD
OCT 76	SEP 82	DA		C. IN-HOUSE

17 CONTRACT/GRANT

a DATE EFFECTIVE: EXPIRATION:
b NUMBER:
c TYPE: d AMOUNT:
e KIND OF AWARD: F. CUM/TOT: $ 0

18 RESOURCES ESTIMATE		a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	1.0	$ 56
	CURRENT 1982	0.7	$ 42

19 a RESPONSIBLE DOD ORGANIZATION: 407838 2406

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c GENERAL USE:

21A. B. C. D. E.

20 PERFORMING ORGANIZATION: 407838 2406

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ASSOCIATE INVESTIGATORS

NAME: REAMS, W. H.

NAME: NELSON, J.H.

22 KEYWORDS (Precede Each with Security Classification Code): (U) HELICOPTER RIG ;(U) LIQUID DISPERSAL ;(U) AERIAL APPLICATION;(U) MOSQUITO CONTROL ;(U) LIQUID INSECTICIDE;

23 TECHNICAL OBJECTIVE, 24 APPROACH, 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code):

OBJECTIVE:(U) TO IDENTIFY A SUITABLE COMMERCIAL, HELICOPTER SLUNG, DISPERSAL UNIT FOR APPLYING LIQUID FORMULATIONS OF INSECTICIDES, WHICH WOULD- (A) BE CAPABLE OF DISPENSING LIQUID INSECTICIDES WHEN SLUNG BENEATH A HELICOPTER- (B) REQUIRE NO MODIFICATION OF THE AIRCRAFT- (C) BE CAPABLE OF APPLYING ADEQUATE SWATH WIDTHS AND DEPOSITION RATES FOR CONTROLLING DISEASE VECTORS IN COMBAT SITUATIONS OR CONUS.

APPROACH: (U) A TRANSLAND UNIT HAS BEEN SELECTED AS THE MOST SUITABLE UNIT FOR FIELD FEASIBILITY. MODIFICATIONS WILL BE MADE PRIOR TO FURTHER OPERATIONAL TESTING. UNIT HAS BEEN USED SUCCESSFULLY IN ACTUAL FIELD MOSQUITO CONTROL OPERATIONS.

PROGRESS: (U) 8010 - 8109. THE TRANSLAND UNIT HAS BEEN MODIFIED TO SATISFY THE DEFICIENCIES OBSERVED IN OT II. FURTHER MODIFICATIONS TO IMPROVE THE ULV CAPABILITY WILL BE MADE. UNIT WILL RECEIVE FURTHER DEVELOPMENT AND OPERATIONAL TESTING IN FY 82.

*Add approved by contractors upon originator's approval

PROCESSING DATE: 30 NOV 81

DD FORM MAY 88 1498M DTIC FORMAT 850 PAGE 12

DETAIL SHEET

TITLE: (U) Pesticide Dispersal Unit, Liquid, Helicopter Slung

FUNDING HISTORY: PY - 12K; CY - 56K; BY - 42K

PROBLEM DEFINITION: To adapt a commercial aerial sprayer to meet the needs of the military for a slung unit that is capable of liquid dispersal in both high volume and ultra-low volume modes.

IMPORTANCE: Medical personnel engaged in field operations need the capacity for aerial dispersal of liquid pesticide formulations. The unit is needed to ensure rapid treatment of large areas inaccessible by ground equipment but too small for efficient use of larger aerial dispersal equipment. Current standard item represents a health and safety hazard to the helicopter crew since unit is internally mounted instead of slung.

APPROACH: To adapt a readily available commercial sprayer for military use. The commercial sprayer will be modified to include a ULV Beecomist nozzle system and a means for effective control of unit functions from the interior of the helicopter. Unit will be completely independent of the helicopter and easily jettisonable in an emergency.

ACHIEVEMENTS: Deficiencies noted during OT II (FY 80) have been corrected. Equipment is presently ready for OT IIa scheduled during FY 82. Equipment design has been modified to increase the capability to apply ULV pesticides. Extensive modifications had been accomplished which have improved the reliability of the electrical system on the sprayer.

RELATIONSHIP TO CORE PROGRAM: Project involves evaluation and modification of a commercial unit. Item will replace a current obsolete standard item which is a part of the TOE of the Preventive Medicine Detachment, Team LA. Project is part of the pest control equipment program.

MANUSCRIPT: Helicopter-slung Insecticide Dispersal Equipment, Kardatzke, Dr. James T., Nelson, Dr. James H., Conway, William H., and William H. Reams. Oral presentation at AMCA Annual Meeting, 15-18 March 1981, San Antonio, TX.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) FIELD EQUIPMENT ;(U) FIELD CONDITIONS ;(U) WORK ;(U) SOURCES ;(U) MEDICAL SERVICES ;(U) INDUSTRIES

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 AGENCY ACCESSION: DA0B6247	2 DATE OF SUMMARY: 01 OCT 81	REPORT CONTROL SYMBOL: FHP24C					
3 DATE PREV SUM RY: 01 OCT 80	4 KIND OF SUMMARY: D. CHANGE	5 SUMMARY SCTY: U	6 WORK SECURITY: U	7 REGRADING:	8a DISTRIBUTION INSTR: NL	8b SPECIFIC DATA CONTRACTOR ACCESS: [X] YES [ ] NO	9 LEVEL OF SUM: A. WORK UNIT
10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
a PRIMARY:	64717A	3S464717D832		CA		048	
b CONTRIBUTING:							
c CONTRIBUTING:							

11 Type Precede with Security Classification Code:

(U) X-RAY FILM PROCESSOR, DENTAL, PORTABLE FIELD

12 SCIENTIFIC AND TECHNOLOGICAL AREAS:

003500 CLIN MEDICINE 009800 MED HOSP EQ

13 START DATE: DEC 78	14 ESTIMATED COMPLETION DATE: JUN 82	15 FUNDING AGENCY: DA			16 PERFORMANCE METHOD: C. IN-HOUSE
17 CONTRACT/GRANT: a DATES EFFECTIVE:	EXPIRATION:	18 RESOURCES ESTIMATE		a PROFESSIONAL MAN YRS	b FUNDS (in Thousands)
c NUMBER:		FISCAL YEAR	PRECEDING 1981	0.1	$ 8
d TYPE:	e AMOUNT:		CURRENT 1982	0.1	$ 2
f KIND OF AWARD:	F. CUM/TOT: $ 0				

19 RESPONSIBLE DOD ORGANIZATION: 407838 2406

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ASSOCIATE INVESTIGATORS

NAME

NAME

21 GENERAL USE: 21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code): (U) X-RAY ;(U) FIELD MEDICINE ;(U) FIELD EQUIPMENT ;(U) DENTAL PROCESSOR ;(U) PROCESSOR

23 TECHNICAL OBJECTIVE; 24 APPROACH; 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code):

OBJECTIVE:(U) TO IDENTIFY A SUITABLE X-RAY FILM PROCESSING PORTABLE FIELD UNIT TO SUPPORT A LOW CAPACITY X-RAY UNIT.

APPROACH: (U) SEARCH EXISTING INDUSTRIAL SOURCES FOR A FUNCTIONAL DEVICE THAT CAN BE ADOPTED. IF NONE IS AVAILABLE, MODIFY, DESIGN OR CONTRACT FOR THE DESIGN OF A NEW DEVICE.

PROGRESS: (U) 8010 - 8109. COMMERCIAL ITEM MODIFIED FOR 110/220 V SERVICE BY ADDITION OF A TRANSFORMER. OPERATIONAL CAPABILITY AT PLUS 40 DEGREES F WITH THE ADDITION OF IMMERSION HEATER WAS ACCOMPLISHED AND EVALUATED SUCCESSFULLY. OPERATIONAL AND MAINTENANCE MANUAL BEING PREPARED FOR FINAL TYPE CLASSIFICATION ACTION.

*Available to contractors upon signature approval

PROCESSING DATE: 13 JAN 82

DD FORM MAY 88 1498M DTIC FORMAT 850

DETAIL SHEET

TITLE: (U) X-Ray Film Processor, Dental, Portable, Field

FUNDING HISTORY: PY - 25K; CY - 8K; BY - 2K

PROBLEM DEFINITION: To identify a suitable X-Ray Film Processing Portable Field unit to support a low capacity X-ray unit.

IMPORTANCE: Portable wet X-ray film processors and accessories are not suitable for use by small dental units outside of field type hospitals based on excessive weight, complexity, and requirements for electrical power, water, and processing chemicals. The need is acute and critical for dental units/sections to complement the low capacity X-ray apparatus recently approved for limited procurement.

APPROACH: Search and obtain an industrially developed functional device that can be adapted to meet the established characteristics.

ACHIEVEMENTS: Operational Testing I (OT I) was initiated on 16 July 1979 and completed on 26 October 1979. Results were good with only minor design changes. Prototype was modified to correct OT I deficiencies and subjected to Development Testing II (DT II). DT II was successfully concluded on 3 March 1980. Maintenance evaluation was accomplished and concluded on 3 March 1981. Modified commercial Operations and Mantenance Manual was forwarded to USAMMA for review and concurrence.

RELATIONSHIP TO CORE PROGRAM: This program is directly related to the Laboratory's mission to develop field medical materiel.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) CLINICAL MEDICINE ;(U) BAGS ;(U) FUNCTIONAL ANALYSIS (U) FIELD EQUIPMENT ;(U) EMERGENCIES ;(U) TREATMENT ;(U) REPLACEMENT THEORY;(U) *MEDICAL EQUIPMENT ;(U) *FIRST AID ;(U) PARAMEDICAL SCIENCES ;(U) PLATOON LEVEL ORGANIZATIONS ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 AGENCY ACCESSION	2 DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0B6215	01 OCT 81	FHP24C

3 DATE PREV SUMRY	4 KIND OF SUMMARY	5 SUMMARY SCTY	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION INSTR	8b SPECIFIC DATA	9 LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	[X] CONTRACTOR ACCESS YES [ ] NO	A. WORK UNIT

10 NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a PRIMARY	64717A	3S464717D832	BB	049
b CONTRIBUTING				
c CONTRIBUTING				

11 TITLE (Precede with Security Classification Code)

(U) BAG, AIDMAN'S, REDESIGN OF

12 SCIENTIFIC AND TECHNOLOGICAL AREAS

002400 BIOENGINEERING 009800 MED HOSP EQ

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY	16 PERFORMANCE METHOD
MAY 77	SEP 82	DA	C. IN-HOUSE

17 CONTRACT/GRANT

a DATES EFFECTIVE — EXPIRATION

b NUMBER

c TYPE — d AMOUNT

e KIND OF AWARD — F. CUM/TOT: $ 0

18 RESOURCES ESTIMATE	a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
PRECEDING FISCAL YEAR 1981	0.6	$ 47
CURRENT FISCAL YEAR 1982	0.1	$ 8

19 RESPONSIBLE DOD ORGANIZATION 407838 2406

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ASSOCIATE INVESTIGATORS

NAME: CONWAY, W H

NAME

21 GENERAL USE

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code)

(U) AID BAG ;(U) AIDMAN;(U) EMERGENCY MEDICAL TREATMENT (U) FIELD MEDICAL EQUIPMENT ;(U) CASE, MEDICAL INSTRUMENT AND SUPPLY ;

23 TECHNICAL OBJECTIVE, 24 APPROACH, 25 PROGRESS (Further individual paragraphs identified by number. Precede text of each with Security Classification Code.

OBJECTIVE:(U) TO DEVELOP AN IMPROVED AID BAG FOR USE BY THE PLATOON AIDMAN.

APPROACH: (U) FUNCTIONAL CRITERIA FOR AID BAGS WILL BE ESTABLISHED. SEVERAL POTENTIAL REPLACEMENTS WILL BE DESIGNED, FABRICATED AND EVALUATED. THE BEST FEATURES OR EACH MODEL WILL BE INCORPORATED INTO A FINAL DESIGN.

PROGRESS: (U) 8010 - 8109. THE PROTOTYPE DESIGN AND THE TEST DATA OBTAINED THUS FAR WERE SUBMITTED TO STUDY BY A JOINT WORKING GROUP (JWG). WHILE APPROVING THE CONCEPT, THE JWG MANDATED ADDITIONAL TESTING AND RAISED SEVERAL ISSUES CONCERNING THE NEED FOR WATERPROOF CHEMICALPROOF FABRICS AND THE ABILITY TO FIT THIS EQUIPMENT INTO THE ASSEMBLAGE OF EQUIPMENT ALREADY BEING CARRIED BY THE AID MAN. THESE ISSUES ARE UNDER STUDY AS OF THIS REPORT DATE AND ADDITIONAL TEST PROTOTYPES OF THE ORIGINAL DESIGN ARE BEING FABRICATED.

*Available to contractors upon originators approval

PROCESSING DATE: 08 JAN 82

DD FORM 1 MAY 88 1498M DTIC FORMAT 850 PAGE 13

DETAIL SHEET

TITLE: (U) Bag, Aidman's, Redesign of

FUNDING HISTORY: PY - 16K; CY - 47K; BY - 8K

PROBLEM DEFINITION: The current case, Medical Instrument and Supply Set (NSN 6545-00-912-9870) has been found inadequate. Because of the small size and configuration of the bag, the aidman is severely limited in his treatment capability in combat. The need exists for a larger bag, which provides easier access to its contents.

IMPORTANCE: The ability of the combat medical corpsman to provide prompt and effective treatment to soldiers in the field will be greatly enhanced by providing him with an aid bag containing a wider variety of medications, dressings, and instruments, which are easily accessible.

APPROACH: Various bags and cases which are already in the supply system were investigated. The bags most suitable for the projected need of the platoon aidman were either too small (M-3), overly compartmented (M-16), or without organizing compartments (M-5).

ACHIEVEMENTS: The prototype design and the test data obtained thus far were submitted to study by a joint working group (JWG). While approving the concept, the JWG mandated additional testing and raised several issues concerning the need for waterproof chemicalproof fabrics and the ability to fit this equipment into the assemblage of equipment already being carried by the aidman. These issues are under study as of this report date, and additional test prototypes of the original design are being fabricated.

RELATIONSHIP TO CORE PROGRAM: The design and development of a more efficient aid bag for use by the platoon aidman is consonant with the mission of The Surgeon General to provide the best in medical treatment for the soldier in the field.

MANUSCRIPT: A New Aid Bag for the Combat Medical Corpsman; O'Connor, Richard J., Brewer, Robert R., and Luther T. Geasey, Jr. Technical Report 8103, Feb 81.

ENVIRONMENTAL QUALITY TECHNOLOGY

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) MICROBIOLOGY;(U) CONTROL ;(U) REMOVAL ;(U) POPULATION ;(U) PHOSPHORUS ;(U) NUTRIENTS ;(U) WORK ;(U) WASTE WATER ;(U) SURFACES ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
DAOG5855	30 SEP 81	FHK53E

3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8a. DISTRIBUTION INSTR	8b. SPECIFIC DATA ACCESS	9. LEVEL OF SUM
01 OCT 80	K. COMPLETION	U	U		NL	[X] CONTRACTOR YES [ ] NO	A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	121
b. CONTRIBUTING				
c. CONTRIBUTING				

11. (U) EVALUATION OF CHEMICAL ADDITION FOR ENHANCEMENT OF SECONDARY TREATMENT AND ANCILLARY NUTRIENT REMOVAL

12. SCIENTIFIC AND TECHNOLOGICAL AREAS: 003300 CHEM ENGR 003400 CIVIL ENGR 010100 MICROBIO

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
OCT 80	SEP 81	DA	C. IN-HOUSE

17. CONTRACT/GRANT
a. DATES EFFECTIVE: EXPIRATION:
b. NUMBER:
c. TYPE: d. AMOUNT:
e. KIND OF AWARD: F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
PRECEDING FISCAL YEAR 1981	1.3	$ 100
CURRENT FISCAL YEAR 1982	0.0	$ 0

19. RESPONSIBLE DOD ORGANIZATION 407838 2406
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c. GENERAL USE

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ASSOCIATE INVESTIGATORS
NAME
NAME

21A. B. C. D. E.

22. KEYWORDS (Precede EACH with Security Classification Code): (U) WASTEWATER ;(U) PHOSPHORUS ;(U) NITRIFICATION ;(U) BOD REMOVAL ;(U) MICROBIOLOGY

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code):

OBJECTIVE:(U) THIS RESEARCH IS ON THE USE OF THE ROTATING BIOLOGICAL CONTACTOR (RBC) TO UPGRADE ARMY TRICKLING FILTERS TO MEET WASTEWATER DISCHARGE STANDARDS. THE EFFECT OF LOW LEVEL LIME ADDITION FOR PHOSPHORUS REMOVAL WILL BE STUDIED TO DETERMINE WHETHER LESS RBC SURFACE AREA IS REQUIRED FOR CARBON OXIDATION. THE DISTRIBUTION OF POPULATIONS OF HETEROTROPHIC AND AUTOTROPHIC ORGANISMS WILL BE CORRELATED WITH ORGANIC LOADING RATES AND REMOVAL EFFICIENCIES.

APPROACH: (U) THREE RBC UNITS WILL BE OPERATED IN PARALLEL AS FOUR THREE-STAGE TREATMENT SYSTEMS. A CONTROL UNIT WILL BE OPERATED ALONG WITH THREE EXPERIMENTAL UNITS SO THAT COMPARISONS OF DATA ARE MORE ACCURATE.

PROGRESS: (U) 8010-8109. WORK COMPLETED; FINAL REPORT IN PREPARATION. THE PRIMARY EFFECT OF LOW-LEVEL LIME ADDITION IS TO REDUCE THE ORGANIC LOADING, THEREBY PREVENTING OVERLOADING OF THE FIRST STAGE OF THE RBC, AND MAKING MORE SURFACE AREA OF SUBSEQUENT STAGES AVAILABLE FOR NITRIFICATION.

*Available to contractors upon signature approval.

PROCESSING DATE: 28 FEB 82

DD FORM MAY 88 1498M DTIC FORMAT 850 PAGE 8

DETAIL SHEET

TITLE: Evaluation of Chemical Addition for Enhancement of Secondary Treatment and Ancillary Nutrient Removal

FUNDING HISTORY: PY - 0; CY - 294; BY - 0

PROBLEM DEFINITION: This research addresses the use of the rotating biological contactor (RBC) to upgrade Army trickling filters to meet wastewater discharge standards. The effect of low-level lime addition for phosphorus removal will be studied to determine whether less RBC surface area is required for carbon oxidation. The distribution of populations of heterotrophic and autotrophic organisms will be correlated with organic loading rates and removal efficiencies.

IMPORTANCE: The RBC is in use at a number of installations to help the Army achieve mandated discharge criteria. Some installations have encountered problems in achieving nutrient removal.

APPROACH: Three RBC units are operated in parallel as four three-stage treatment systems. A control unit is operated along with three experimental units so that comparisons of data are more accurate.

ACHIEVEMENTS: Work completed; final report in preparation. The primary effect of low-level lime addition is to reduce the organic loading, thereby preventing overloading of the first stage of the RBC, and making more surface area of subsequent stages available for nitrification.

RELATIONSHIP TO CORE PROGRAM: This research is part of the Army's effort in water pollution hazard assessment, source reduction, control, and treatment technology.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) TOXICOLOGY ;(U) TOXICITY ;(U) STATICS ;(U) MILITARY FACILITIES ;(U) ARMY ;(U) AQUATIC ORGANISMS ;(U) *AMMUNITION ;(U) *WATER POLLUTION ;(U) FISHES

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

AGENCY ACCESSION	DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0B6188	01 OCT 81	FHP24C

DATE PREV SUMRY	KIND OF SUMMARY	SUMMARY SCTY	WORK SECURITY	REGRADING	DISTRIBUTION INSTR	SPECIFIC DATA	LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	CONTRACTOR ACCESS YES [X] NO [ ]	A. WORK UNIT

10 NO./CODES:*	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	123
b. CONTRIBUTING				
c. CONTRIBUTING				

11. TITLE (Precede with Security Classification Code)*

(U) SCREENING OF MILITARY CHEMICALS FOR TOXICITY OF AQUATIC ORGANISMS

12. SCIENTIFIC AND TECHNOLOGICAL AREAS *

005900 ENVIR BIOLOGY 016800 TOXICOLOGY

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
OCT 76	CONT	DA	C. IN-HOUSE

17. CONTRACT/GRANT
a. DATES EFFECTIVE — EXPIRATION
b. NUMBER *
c. TYPE — d. AMOUNT
e. KIND OF AWARD — F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE	PRECEDING	a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR	1981	1.6	$ 124
	CURRENT 1982	2.4	$ 150

19. RESPONSIBLE DOD ORGANIZATION 407838 2406
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NAME

21. GENERAL USE
21A. B. C. D. E.

22. KEY WORDS (Precede EACH with Security Classification Code)

(U) MUNITIONS ;(U) PESTICIDES ;(U) AQUATIC TOXICOLOGY;(U) HAZARDOUS WASTES ;

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code.)

OBJECTIVE:(U) TO PROVIDE AQUATIC TOXICITY DATA REQUIRED IN CONJUNCTION WITH IN-HOUSE AND EXTRAMURAL RESEARCH RELATED TO MUNITIONS PRODUCTION. THESE DATA WILL HELP ASSESS THE HAZARD TO ACQUATIC ORGANISMS OF ARMY-RELEVANT MATERIALS AND AID IN THE POLLUTION ABATEMENT PROCESS AT ARMY FACILITIES.

APPROACH: (U) TO CONDUCT AQUATIC TOXICITY TESTING THROUGH COMPARATIVE SCREENING TESTS AND THROUGH GENERATION OF ACUTE TOXICITY DATA- TO EVALUATE STATE-OF-THE-ART TOXICITY TESTING METHODS TO DETERMINE APPLICABILITY TO RESEARCH REQUIREMENTS- TO ADVANCE THE STATE-OF-THE-ART IN TOXICITY TESTING METHODS WHERE RESEARCH REQUIREMENTS CANNOT BE MET WITH EXISTING METHODS.

PROGRESS: (U) 8010 - 8109. THE TOXICITY OF 1,3-DINITROBENZENE (DNB), 3,5-DINITROANILINE (DINA), AND 1,3,5-TRINITROBENZENE (TNB) TO FOUR SPECIES OF FISH AND AN INVERTEBRATE HAVE BEEN DETERMINED. TNB WAS THE MOST TOXIC OF THE THREE MATERIALS; THE 96-HOUR LC50S FOR ALL FOUR FISH SPECIES WERE BETWEEN 0.4 AND 0.9 MG/L. EFFECTS ON GROWTH WERE NOTED AT CONCENTRATIONS AS LOW AS 0.09 MG/L IN AN EARLY LIFE STAGE TEST WITH RAINBOW TROUT, SALMO GAIRDNERI. A WIDER RANGE OF TOXICITY WAS FOUND WITH DNB, WITH LC50S RANGING FROM 27.4 MG/L (48-HOUR EXPOSURE, DAPHNIA MAGNA) TO 1.4 MG/L (96-HOUR EXPOSURE, BLUEGILLS, LEPOMIS MACROCHIRUS). WITH DINA, 96-HOUR LC50S WERE HIGHEST FOR THE FATHEAD MINNOW (PIMEPHALES PROMELAS) AT 21.1 MG/L AND LOWEST FOR RAINBOW TROUT AT 3.0 MG/L. CHRONIC AND EARLY LIFE STAGE TESTS ARE BEING USED TO DEFINE THE LOWER EFFECT LEVELS OF THESE MATERIALS TO THE MOST SENSITIVE OF THE SPECIES TESTED.

*Available to contractors upon originators approval

PROCESSING DATE: 21 APR 82

DD FORM MAY 88 1498M DTIC FORMAT 850 PAGE 9

DETAIL SHEET

TITLE: Screening of Military Chemicals for Toxicity of Aquatic Organisms

FUNDING HISTORY: PY - 63K; CY - 124K; BY - 150K

PROBLEM DEFINITION: This project is designed to provide data on the toxicity of munitions-related materials to aquatic organisms. Short- and longer-term tests with several species of fish and an invertebrate will be conducted under static and dynamic water flow conditions. Effects on mortality and, in certain tests, growth and reproduction will be recorded.

IMPORTANCE: Pollution control facilities at Army ammunition plants are currently being upgraded. The type and extent of treatment required for aqueous effluents will depend greatly on the toxicity of the effluent components to aquatic life. Generation of this toxicity information will aid in assessing the environmental hazard posed by the munitions-related materials found in these effluents.

APPROACH: Preliminary screening tests include static, acute tests with fish and an invertebrate. These are followed by dynamic (flow-through) acute tests. Effects on the sensitive life stages of fish will be evaluated using a 35 day embryo-larval test. Survival, growth, and reproduction of an invertebrate will be determined in a full life cycle test.

ACHIEVEMENTS: Static, acute screening tests have been completed with four species of fish and an invertebrate. Materials tested included 1,3-dinitrobenzene, 1,3,5-trinitrobenzene, and 3,5-dinitroaniline. Of these, 1,3,5-trinitrobenzene was by far the most toxic, with 96-hour LC50's of 1 mg/L or less. Longer term flow-through tests with selected fish species have also been completed and have provided useful information on the level and kinds of effects of these compounds.

RELATIONSHIP TO CORE PROGRAM: This work is based on a request by the US Army Materiel Command for information relating to the design of waste treatment facilities. Measurements of the toxicity to aquatic organisms of various components of a waste effluent are an important part of the data base required for the design of proper waste treatment techniques.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) CHARCOAL ;(U) BIOASSAY ;(U) ARMY ;(U) AQUATIC ORGANISMS ;(U) WATER TREATMENT ;(U) WATER ;(U) WASTES;(U) WASTE TREATMENT ;(U) SOLIDS;(U) SEWAGE DISPOSAL ;(U) PESTICIDES ;(U) ORGANIC COMPOUNDS ;(U) OILS ;(U) MILITARY FACILITIES

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

AGENCY ACCESSION: DA086230 | 2 DATE OF SUMMARY: 01 OCT 81 | REPORT CONTROL SYMBOL: FHP24C

3 DATE PREV SUM	4 KIND OF SUMMARY	5 SUMMARY SECTY	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION INSTR	8b SPECIFIC DATA	9 LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	☒ CONTRACTOR ACCESS YES ☐ NO	A. WORK UNIT

10 NO./CODES *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a PRIMARY	62720A	3E162720A835	AA	127
b CONTRIBUTING				
c CONTRIBUTING				

11 TITLE (Precede with Security Classification Code)

(U) EVALUATION OF FILTRATION TECHNIQUES FOR DISPOSAL OF OPERATIONAL WASTES FROM ARMY PEST MANAGEMENT PROGRAMS

12 SCIENTIFIC AND TECHNOLOGICAL AREAS

007800 HYG SANITATION 003300 CHEM ENGR 003400 CIVIL EN

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY	16 PERFORMANCE METHOD
OCT 77	SEP 82	DA	C. IN-HOUSE

17 CONTRACT/GRANT

a DATES EFFECTIVE: EXPIRATION:

b NUMBER:

c TYPE: d AMOUNT:

e AGENCY AWARD: F. CUM/TOT: $ 0

18 RESOURCES ESTIMATE	g PROFESSIONAL MAN YRS	h FUNDS (In Thousands)
FISCAL YEAR PRECEDING 1981	0.9	$ 86
FISCAL YEAR CURRENT 1982	0.3	$ 20

19a PERFORMING ORGANIZATION 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

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RESPONSIBLE INDIVIDUAL

NAME: GENSLER, J.D.

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20 PERFORMING ORGANIZATION 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)

NAME: DENNIS, W H

TELEPHONE: 3016632036

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME: KOBYLINSKI, E A

NAME:

21 GENERAL USE

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code)

(U) HAZARDOUS WASTES ;(U) FILTRATION ;(U) PESTICIDE WASTES ;(U) WASTE TREATMENT ;(U) WATER TREATMENT ;

23 TECHNICAL OBJECTIVE, 24 APPROACH, 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO EVALUATE THE USE OF FILTRATION/ADSORPTION TECHNIQUES FOR TREATMENT OF WASTES GENERATED BY ARMY INSTALLATION PEST CONTROL FACILITIES.

APPROACH: (U) THE FILTRATION/ADSORPTION SYSTEM WILL BE TAKEN TO FORT EUSTIC, VA AND SET UP WITHIN THE NEW FORT EUSTIS PEST CONTROL FACILITY FOR ON-SITE TESTING. WASTEWATER FROM THE FORT EUSTIS FACILITY WILL BE COLLECTED, STORED AND TREATED BY THE CARBON ADSORPTION SYSTEM. EFFLUENT SAMPLES FROM EACH CARBON COLUMN WILL BE COLLECTED ON-SITE AND ANALYZED AT FORT DETRICK'S ENVIRONMENTAL PROTECTION RESEARCH DIVISION LABORATORY. FROM THIS DATA WE WILL EVALUATE THE PERFORMANCE OF THE ABSORPTION SYSTEM.

PROGRESS: (U) 8010 - 8109. FIELD TESTING OF THE FLOW-THROUGH SERIES OF CARBON COLUMNS AT FORT EUSTIS, VA. IS OVER. THIS SYSTEM OPERATED AT 0.2 GPM. WILL RELIABLY REMOVE MALATHION BAYGON, DIAZINON AND DIMETHOATE FROM WATER. DURSBAN AND 2,4-D ESTER ARE REMOVED WITH DIFFICULTY AND CHLORDANE IS ONLY PARTIALLY REMOVED. BREAKTHROUGH DATA IS AVAILABLE FOR SOME OF THESE SUBSTANCES AND A FINAL REPORT IS IN PREPARATION. CONCURRENT WITH THIS WORK, WE BEGAN THE EVALUATION OF A NEW CARBON FILTRATION SYSTEM, THE CARBULATOR SUPERSCRIPT R. ALL TESTS WITH THIS SYSTEM HAVE BEEN SUCCESSFUL.

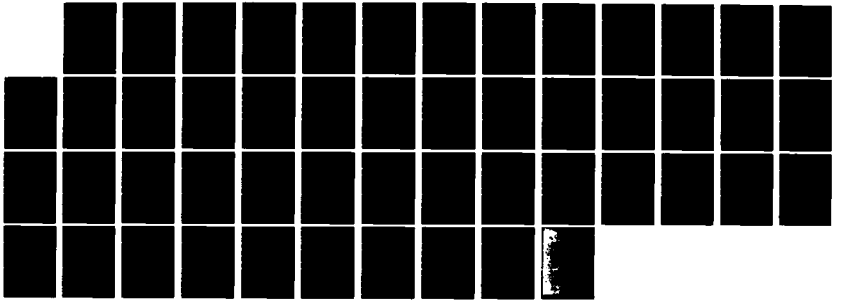
*Add 8010 to contractors' work effort entries

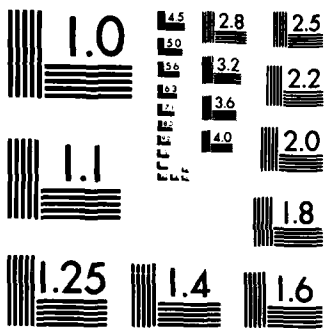
PROCESSING DATE: 06 JAN 82

DD FORM MAY 68 1498M DTIC FORMAT 850 PAGE 16

AD-A127 646 US ARMY MEDICAL BIOENGINEERING RESEARCH AND DEVELOPMENT LABORATORY ANNUAL..(U) ARMY MEDICAL BIOENGINEERING RESEARCH AND DEVELOPMENT LAB FORT.. J N ALBERTSON 2/2

UNCLASSIFIED 01 OCT 81 F/G 6/5 NL





RETRIEVAL TERMS ASSIGNED BY DTIC (U) CHARCOAL ;(U) BIOASSAY ;(U) ARMY ;(U) AQUATIC ORGANISMS ;(U) WATER TREATMENT ;(U) WATER ;(U) WASTES;(U) WASTE TREATMENT ;(U) SOLIDS;(U) SEWAGE DISPOSAL ;(U) PESTICIDES ;(U) ORGANIC COMPOUNDS ;(U) OILS ;(U) MILITARY FACILITIES

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

AGENCY ACCESSION	2 DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA086230	01 OCT 81	FHP24C

3 DATE PREV SUM BY	4 KIND OF SUMMARY	5 SUMMARY SCTY	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION INSTR	8b SPECIFIC DATA: CONTRACTOR ACCESS YES [X] NO [ ]	9 LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL		A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	127
b. CONTRIBUTING				
c. CONTRIBUTING				

11. TITLE (Precede with Security Classification Code): (U) EVALUATION OF FILTRATION TECHNIQUES FOR DISPOSAL OF OPERATIONAL WASTES FROM ARMY PEST MANAGEMENT PROGRAMS

12. SCIENTIFIC AND TECHNOLOGICAL AREAS: 007800 HYG SANITATION; 003300 CHEM ENGR; 003400 CIVIL EN

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
OCT 77	SEP 82	DA	C. IN-HOUSE

17. CONTRACT/GRANT
a. DATES EFFECTIVE — EXPIRATION
b. NUMBER
c. TYPE — d. AMOUNT
e. KIND OF AWARD — F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE		a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	0.9	$ 86
	CURRENT 1982	0.3	$ 20

19. RESPONSIBLE DOD ORGANIZATION: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
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RESPONSIBLE INDIVIDUAL
NAME: GENSLER, J.D.
TELEPHONE: 3016632014

20. PERFORMING ORGANIZATION: 407838 2406
NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB
ADDRESS: FT DETRICK MD 21701
PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)
NAME: DENNIS, W H
TELEPHONE: 3016632036
SOCIAL SECURITY ACCOUNT NUMBER
ASSOCIATE INVESTIGATORS
NAME: KOBYLINSKI, E A
NAME:

21. GENERAL USE: 21A. B. C. D. E.

22. KEYWORDS (Precede EACH with Security Classification Code): (U) HAZARDOUS WASTES ;(U) FILTRATION ;(U) PESTICIDE WASTES ;(U) WASTE TREATMENT ;(U) WATER TREATMENT ;

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code):

OBJECTIVE:(U) TO EVALUATE THE USE OF FILTRATION/ADSORPTION TECHNIQUES FOR TREATMENT OF WASTES GENERATED BY ARMY INSTALLATION PEST CONTROL FACILITIES.

APPROACH: (U) THE FILTRATION/ADSORPTION SYSTEM WILL BE TAKEN TO FORT EUSTIC, VA AND SET UP WITHIN THE NEW FORT EUSTIS PEST CONTROL FACILITY FOR ON-SITE TESTING. WASTEWATER FROM THE FORT EUSTIS FACILITY WILL BE COLLECTED, STORED AND TREATED BY THE CARBON ADSORPTION SYSTEM. EFFLUENT SAMPLES FROM EACH CARBON COLUMN WILL BE COLLECTED ON-SITE AND ANALYZED AT FORT DETRICK'S ENVIRONMENTAL PROTECTION RESEARCH DIVISION LABORATORY. FROM THIS DATA WE WILL EVALUATE THE PERFORMANCE OF THE ABSORPTION SYSTEM.

PROGRESS: (U) 8010 - 8109. FIELD TESTING OF THE FLOW-THROUGH SERIES OF CARBON COLUMNS AT FORT EUSTIS, VA, IS OVER. THIS SYSTEM OPERATED AT 0.2 GPM, WILL RELIABLY REMOVE MALATHION BAYGON, DIAZINON AND DIMETHOATE FROM WATER. DURSBAN AND 2,4-D ESTER ARE REMOVED WITH DIFFICULTY AND CHLORDANE IS ONLY PARTIALLY REMOVED. BREAKTHROUGH DATA IS AVAILABLE FOR SOME OF THESE SUBSTANCES AND A FINAL REPORT IS IN PREPARATION. CONCURRENT WITH THIS WORK, WE BEGAN THE EVALUATION OF A NEW CARBON FILTRATION SYSTEM, THE CARBULATOR SUPERSCRIPT R. ALL TESTS WITH THIS SYSTEM HAVE BEEN SUCCESSFUL.

*Available to contractors upon originators approval

PROCESSING DATE: 06 JAN 82

DD FORM 1498M MAY 68 DTIC FORMAT 850 PAGE 16

DETAIL SHEET

TITLE: Evaluation of Filtration Techniques for Disposal of Operational Wastes from Army Pest Management Programs

FUNDING HISTORY: PY - 34; CY - 86; BY - 10K

PROBLEM DEFINITION: To evaluate the use of carbon adsorption techniques for treatment of wastes generated by Army installation pest control facilities.

IMPORTANCE: The US Army operates pest control facilities at its installations throughout the country. Federal law places the responsibility for safe disposal of pesticides and pesticide wastes on the user - DA. As a result, the Army is responsible for the safe disposal of the pesticide waste it generates.

APPROACH: The filtration/adsorption system was taken to Ft. Eustis, VA and set up within the new Ft. Eustis Pest Control Facility for on-site testing. Wastewater from the Ft. Eustis Facilitary was collected, stored and treated by the carbon adsorption system. Effluent samples from each carbon column were collected on-site and analyzed at Ft. Detrick's Environmental Protection Research Division Laboratory. From these data we will evaluate the performance of the adsorption system.

ACHIEVEMENTS: Laboratory tests of the carbon filtration system are complete. A recipe wastewater containing diazinon, dursban, malathion, baygon and chlordane at a level of 1200 mg/L total pesticide has been tested. Five-hundred gallons of such a wastewater may be treated and the effluent will show no diazinon, dursban, malathion, or baygon (below 1 ppm). Chlordane was found in the effluent at concentration near that of the input concentration. Aeration of the wastewater to remove volatile chlorinated solvents from wastewater did not improve performance of the adsorption system. Preliminary leaching tests of spent carbon indicate a very slow rate of pesticide leaching at pH 4.0. The wastewater being generated at Ft. Eustis shows pesticide concentrations much lower than expected. The first test at Ft. Eustis showed removal of all materials except chlordane. The input water contained 16 ppm chlordane while effluent showed 0.2 ppm. Other pesticides present in the input water were kelthane (42 ppm) and dursban (1 ppm); these were absent in the effluent. During the second field test, the Ft. Eustis input wastewater contained less than 0.5 ppm of any of the expected pesticides.

RELATIONSHIP TO CORE PROGRAM: This research is a part of the Army's evaluation of health and environmental consequences of the disposal of hazardous wastes and pesticides generated by military activities.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) ARMY ;(U) CONSTRUCTION;(U) HEALTH PHYSICS ;(U) LAW (U) MILITARY FACILITIES ;(U) MILITARY REQUIREMENTS ;(U) NITROGEN ;(U) ORGANIC MATERIALS ;(U) PHOSPHORUS ;(U) PROCESSING ;(U) PURIFICATION;(U) REMOVAL ;(U) REVIEWS ;(U) SURFACES ;(U)

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

AGENCY ACCESSION	DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0A6947	30 SEP 81	FHK53E

1. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8a. DISTRIBUTION INSTR	8b. SPECIFIC DATA - CONTRACTOR ACCESS	9. LEVEL OF SUM
01 OCT 80	K. COMPLETION	U	U		NL	☑ YES ☐ NO	A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	137
b. CONTRIBUTING	CDOG 011	4F		
c. CONTRIBUTING				

11. TITLE (Precede with Security Classification Code)

(U) DEVELOPMENT AND EVALUATION OF CRITERIA FOR ADVANCED WASTEWATER TREATMENT PROCESSES AT MILITARY INSTALLATIONS

12. SCIENTIFIC AND TECHNOLOGICAL AREAS:

003300 CHEM ENGR 003400 CIVIL ENGR

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD
MAY 72	SEP 81	DA		C. IN-HOUSE

17. CONTRACT/GRANT

a. DATES EFFECTIVE: EXPIRATION:

b. NUMBER:

c. TYPE: d. AMOUNT:

e. KIND OF AWARD: F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE

	PRECEDING	a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR	1981	1.3	$ 97
CURRENT	1982	0.0	$ 0

19a. RESPONSIBLE DOD ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

RESPONSIBLE INDIVIDUAL

NAME: GENSLER, J.D.

TELEPHONE: 3016632014

20. GENERAL USE

21A. B. C. D. E.

20. PERFORMING ORGANIZATION: 407838 2406

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PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)

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TELEPHONE: 3016637207

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME: BARTGIS, K A

NAME

22. KEYWORDS (Precede EACH with Security Classification Code)

(U) SANITARY ENGINEERING ;(U) NUTRIENT REMOVAL ;(U) WASTEWATER TREATMENT ;(U) POLLUTION ABATEMENT

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) PROVIDE ADVANCED WASTEWATER TREATMENT (AWT) TECHNOLOGY APPLICABLE TO US ARMY WASTEWATER TREATMENT PLANTS SO THAT NPDES PERMIT LIMITATIONS UNDER PL 92-500 CAN BE MET. DESIGN CRITERIA WILL BE ESTABLISHED FOR SELECTED PROCESSES WITH INITIAL EMPHASIS ON ORGANIC LOADING RATES AND NITROGEN REMOVAL PROCEDURES. EVALUATION OF PHOSPHORUS REMOVAL TECHNIQUES AND THE PROCESSING OF THE RESULTANT CHEMICALLY TREATED EFFLUENT ARE CONSIDERED IN RELATION TO UPGRADING EXISTING WASTE TREATMENT FACILITIES. THE APPLICABILITY OF COMBINING CARBON AND NITROGEN OXIDATION PROCESSES WILL BE EVALUATED TO DETERMINE ITS IMPACT ON UPGRADING US ARMY WASTEWATER FACILITIES.

APPROACH: (U) PILOT-SCALE STUDIES WILL BE CONDUCTED ON SELECTED ADVANCED WASTEWATER TREATMENT PROCESSES AND PROBLEMS. EMPHASIS WILL BE PLACED ON UPGRADING EXISTING FACILITIES, RATHER THAN ATTEMPTING TO DEVELOP PROCESSES AND PROCEDURES FOR TOTALLY NEW TREATMENT PLANTS. THE GOAL WILL BE TO SATISFY NPDES PERMIT LIMITATIONS FOR DESIGNATED POLLUTANTS, AS OPPOSED TO ATTEMPTING TO OBTAIN DESIGN CRITERIA FOR EXTREMELY LOW POLLUTANT LEVELS. LABORATORY AND BENCH-SCALE STUDIES WILL BE CONDUCTED IN SUPPORT OF PILOT SCALE OPERATIONS.

PROGRESS: (U) 8010-8109. PROJECT COMPLETED. FINAL REPORTS BEING PREPARED UNDER DAOG 5855 AND DAOG 0704.

* Available to contractors upon originators approval

PROCESSING DATE: 10 MAR 82

DD FORM 1498M MAY 88 DTIC FORMAT 850 PAGE 1

DETAIL SHEET

TITLE: Development and Evaluation of Criteria for Advanced Wastewater Treatment Processes at Military Installations

FUNDING HISTORY: PY - 117; CY - 294; BY - 0

PROBLEM DEFINITION: To evaluate phosphorus removal techniques and processing of the resultant chemically treated effluent and chemical sludges produced. The applicability of combining carbon and nitrogen oxidation processes will be evaluated to determine its impact on upgrading US Army wastewater facilities.

IMPORTANCE: The importance of this work lies in optimizing wastewater treatment processes through combining chemical/physical treatment technologies with biological processes. The goal is to improve the overall plant efficiency with minimal construction. Combining low-level lime treatment processes for phosphours removal followed by biological recarbonation not only allows for phosphours concentrations to meet effluent limitations, but also enhances nitrification. This research is highly-relevant to current Army problems of compliance with discharge limitations at installations. It may permit compliance by upgrading existing facilities.

APPROACH: Pilot-scale studies will be conducted on selected advanced wastewater treatment processes and problems. Emphasis will be placed on upgrading existing facilities, rather than attempting to develop processes and procedures for totally new treatment plants. The goal will be to satisfy NPDES permit limitations for designated pollutants, as opposed to attemptng to obtain design criteria for extremely low pollutant levels. Laboratory and bench-scale studies will be conducted in support of pilot-scale operations.

ACHIEVEMENTS: Three technical reports have been published: (1) "Phosphorus Removal in a Pilot Scale Trickling Filter System by Low-Level Lime Addition to Raw Wastewater," R.D. Miller, R.S. Ryczak, and A. Ostrofsky. Technical Report 7901, AD A065041. (2) "Rotating Biological Contactor Process for Secondary Treatment and Nitrification Following a Trickling Filter," R.D. Miller, C.I. Noss, A. Ostrofsky, and R.S. Ryczak. Technical Report 7905, AD A074172. (3) "Rotating Biological Contactor Process for Secondary Treatment and Recarbonation Following Low-Level Lime Addition for Phosphorus Removal," C.I. Noss and R.D. Miller. Technical Report 8007, AD A084944.

RELATIONSHIP TO CORE PROGRAM: An agreement between USAMBRDL and USACERL has been established such that existing equipment and expertise and be used effectively in solving Army waste treatment problems.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) WORK ;(U) STREAMS ;(U) SLUDGE;(U) PH FACTOR ;(U) GRAVITY ;(U) FERMENTATION;(U) EFFLUENTS ;(U) ANAEROBIC PROCESSES

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION: DA0G0704	2. DATE OF SUMMARY: 30 SEP 81	REPORT CONTROL SYMBOL: FHK53E
3. DATE PREV SUM BY: 01 OCT 80	4. KIND OF SUMMARY: K. COMPLETION	5. SUMMARY SCTY: U	6. WORK SECURITY: U	7. REGRADING	8a. DISTRIBUTION INSTR: NL	8b. SPECIFIC DATA: CONTRACTOR ACCESS YES ☑ NO ☐	9. LEVEL OF SUM: A. WORK UNIT
10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
a. PRIMARY:	62720A	3E162720A835		AA	142		
b. CONTRIBUTING:							
c. CONTRIBUTING:							

11. TITLE (Precede with Security Classification Code):

(U) ANAEROBIC DIGESTION OF LIME SLUDGE

12. SCIENTIFIC AND TECHNOLOGICAL AREAS:

007800 HYG SANITATION 003300 CHEM ENGR

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
OCT 79	SEP 81	DA	C. IN-HOUSE

17. CONTRACT/GRANT:

a. DATES EFFECTIVE: EXPIRATION:

b. NUMBER:

c. TYPE: d. AMOUNT:

e. KIND OF AWARD: F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
PRECEDING FISCAL YEAR 1981	1.3	$ 97
CURRENT FISCAL YEAR 1982	0.0	$ 0

19. RESPONSIBLE DOD ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

RESPONSIBLE INDIVIDUAL

NAME: GENSLER, J.D.

TELEPHONE: 3016632014

20. PERFORMING ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

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PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)

NAME: KOBYLINSKI, EA

TELEPHONE: 3016637207

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME: NOSS, CI

NAME: BELL, B.A.

21. GENERAL USE

21A. B. C. D. E.

22. KEYWORDS (Precede EACH with Security Classification Code):

(U) ANAEROBIC ;(U) DIGESTION ;(U) FERRIC CHLORIDE ;(U) LIME ;(U) SLUDGE;

23. TECHNICAL OBJECTIVE; 24. APPROACH; 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code):

OBJECTIVE:(U) RESEARCH ADDRESSES THE MICROBIAL DEGRADATION OF BIOLOGICAL SLUDGES TREATED WITH LIME FOR REMOVAL OF PHOSPHORUS TO MEET DISCHARGE STANDARDS AT ARMY WASTEWATER FACILITIES. THE TECHNICAL OBJECTIVES ARE AS FOLLOWS: (1) VERIFY THE CAUSE OF INHIBITION EXPERIENCED IN THE LIME SLUDGE DIGESTORS AS LIGHT METAL CATION TOXICITY. (2) ESTABLISH THE CONCENTRATION OF CALCIUM AND/OR MAGNESIUM REQUIRED TO CAUSE INHIBITION, (3) INVESTIGATE THE POSSIBLE SYNERGISTIC RELATIONSHIP BETWEEN CALCIUM AND MAGNESIUM, (4) INVESTIGATE THE POTENTIAL USE OF SODIUM AND/OR POTASSIUM AS AN ANTAGONIST TO REDUCE OR ELIMINATE THE INHIBITORY EFFECTS OF CALCIUM AND/OR MAGNESIUM ON THE ANAEROBIC DIGESTION OF LIME SLUDGES, AND (5) DEVELOP A BETTER UNDERSTANDING OF THE ROLE OF LIGHT METAL CATIONS ON ANAEROBIC DIGESTION.

APPROACH: (U) THREE FERMENTORS WILL BE RUN IN PARALLEL. ONE FERMENTOR WILL BE A CONTROL UNIT BEING FED NORMAL PRIMARY SLUDGE. ONE FERMENTOR WILL BE FED A SLUDGE RESULTING FROM COMMERCIAL LIME ADDITION (MAGNESIUM IMPURITIES) WHILE THE THIRD FERMENTOR WILL BE FED SLUDGE RESULTING FROM REAGENT GRADE LIME (NO MAGNESIUM). PROCESS PARAMETERS, PH, GAS, SOLIDS DESTRUCTION, COD DESTRUCTION, CH% AND NH SUB 3 WILL BE MONITORED. AFTER THE INHIBITION OCCURS, SODIUM AND/OR POTASSIUM WILL BE USED AS AN ANTAGONIST.

PROGRESS: (U) 8010 - 8109. WORK COMPLETED; FINAL REPORT IN PREPARATION.

*Available to contractors upon originators approval

PROCESSING DATE: 30 NOV 81

DD FORM MAY 68 1498M DTIC FORMAT 850 PAGE 7

DETAIL SHEET

TITLE: Anaerobic Digestion of Lime Sludge

FUNDING HISTORY: PY - OK; CY - OK; BY - OK

PROBLEM DEFINITION: The purpose of this project is to verify the cause of inhibition experienced in the lime sludge digestors as light metal cation toxicity and to determine the concentration of calcium and/or magnesium required to cause the inhibition. The second half of the study will investigate the possible use of sodium and/or potassium as an antagonist to reduce or eliminate the inhibitory effects of calcium and/or magesium on the anaerobic digestion process.

IMPORTANCE: The importance of this work lies in the optimization of the anaerobic digestion of lime sludges. If the inhibition process occurring in lime digestors can be decreased, any Army wastewater treatment plant using a lime coagulation and sedimentation process can use existing anaerobic digestors, eliminating the need to construct new facilities for sludge digestion.

APPROACH: The fermentors will be run in parallel. One fermentor will be a control unit being fed normal primary sludge. One fermentor will be fed a sludge resulting from commercial lime addition (magnesium impurities) while the third fermentor will be fed sludge resulting from reagent grade lime (no magnesium). Process parameters, pH, gas, solids destruction, COD destruction, CH_4 and NH_3 will be monitored. After the inhibition occurs, sodium and/or potassium will be used as an antagonist.

ACHIEVEMENTS: A technical report is being prepared on the first year's work.

RELATIONSHIP TO CORE PROGRAM: This research is part of the Army's efforts in water pollution source reduction, control, and treatment technology.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA OG 0678	81 10 01	DD-DR&E(AR)636

3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8a. DISP'N INSTR'N	8b. SPECIFIC DATA - CONTRACTOR ACCESS	9. LEVEL OF SUM
80 10 01	H. TERMINATION U		U		NL	☒ YES ☐ NO	A. WORK UNIT

10. NO. CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	144 APC F639
b. CONTRIBUTING				
c. [illegible]	STOG 80-8:14			

11. TITLE (Precede with Security Classification Code) (U) Evaluation of Wastewater Treatment Processes for Disposal of Army Generated Pesticide Wastes

12. SCIENTIFIC AND TECHNOLOGICAL AREAS: 007800 Hygiene and Sanitation; 010100 Microbiology; 003300 Chemical Engineering

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
7910	8109	DA	C. In-House

17. CONTRACT GRANT
a. DATES/EFFECTIVE: EXPIRATION
b. NUMBER:
c. TYPE: d. AMOUNT:
e. KIND OF AWARD: f. CUM. AMT.

18. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (In thousands)
FISCAL YEAR PRECEDING 81	0.8	75
FISCAL YEAR CURRENT 82	0.0	00

19. RESPONSIBLE DOD ORGANIZATION
NAME: US Army Medical Bioengineering Research & Development Laboratory
ADDRESS: Fort Detrick, Frederick, MD 21701

RESPONSIBLE INDIVIDUAL
NAME: Gensler, J.D., COL
TELEPHONE: (301) 663-2014; AUTOVON 343-2014

20. PERFORMING ORGANIZATION
NAME: US Army Medical Bioengineering Research & Development Laboratory
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NAME: Barkley, J.J.
TELEPHONE: (301) 663-2014; AUTOVON 343-2014
SOCIAL SECURITY ACCOUNT NUMBER:

ASSOCIATE INVESTIGATORS
NAME:
NAME:

21. GENERAL USE
Foreign Intelligence Not Applicable

POC:DA

22. KEYWORDS (Precede EACH with Security Classification Code)
(U) Pesticides; (U) Disposal; (U) Degradation; (U) Wastewater

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code.)

23. (U) To evaluate the applicability of wastewater treatment processes for degradation of waste pesticides and rinsates generated by Army pest control facilities. Federal legislation has established that the disposal of pesticide wastes be the responsibility of the user. As a result, many Army pest control facilities do not have the capability to meet the present storage or disposal requirements. The variety of pesticides and pesticide wastes generated by the Army make this a unique effort in waste disposal.

24. (U) Initial work will involve laboratory studies to determine pesticide concentrations which can be recovered from sewage effluents and sludges. Development and modification of extraction procedures are necessary to recover the seeded pesticide and possible degradation products. Pure bacterial cultures and organisms from waste treatment processes will be used in batch degradation studies, followed by the operation of pilot-scale processes. The goal will be to demonstrate the biodegradability, inertness, or accumulation of pesticides in the wastewater treatment processes.

25. (U) 8010 - 8109. Study terminated due to loss of funding.

*Available to contractors upon originator's approval

DETAIL SHEET

TITLE: Evaluation of Wastewater Treatment Processes for Disposal of Army Generated Pesticide Wastes

FUNDING HISTORY: PY - 12; CY - 75; BY - 0

PROBLEM DEFINITION: One objective is to determine the fate of pesticide compounds in sewage treatment processes in common use at military installations. Also, the effect of these compounds on the performance of an experimental trickling filter unit will be assessed.

IMPORTANCE: The Federal Insecticide, Fungicide and Rodenticide Act and the Resource Conservation and Recovery Act apply, respectively, to the use and later discharge of pesticidal substances by the Army. Such substances may reach sewage treatment plants through either intentional discharge or surface runoff. Thus, it is to the advantage of the Army to investigate the fate of these compounds in treatment processes and their possible toxic effect upon these processes.

APPROACH: Seven pesticide compounds, chosen for their widespread use at military installations, will be studied. These are baygon, cygon, chlordane, diazinon, dursban, malathion, and ronnel. Bench-scale settling experiments with and without flocculant will be performed using untreated wastewater and trickling filter effluent from local sources. The persistence of each compound during settling and its partition into aqueous and sediment phases will be determined. Pesticide persistence in bench-scale anaerobic sludge digestion and trickling filter processes will be studied. Pesticide effect on trickling filter performance will be assessed by measuring reductions in important wastewater parameters, in the presence and absence of the pesticides.

ACHIEVEMENTS: A research plan and research protocol were prepared for this work unit.

RELATIONSHIP TO CORE PROGRAM: This research is part of the Army's evaluation of the environmental consequences of the use and discharge of pesticidal substances at military installations. Studies in this area have been requested by TRADOC and have included the development of an activated carbon system for adsorption of pesticides from contaminated wash waters.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) BIODETERIORATION ;(U) ADSORPTION ;(U) HYDROLYSIS ;(U) DEGRADATION ;(U) CHEMICAL REACTIONS;(U) CHEMICAL COMPOUNDS;(U) WORK ;(U) TRANSFORMATIONS (U) SEDIMENTS ;(U) PRODUCTION ;(U) ORDNANCE ;(U) MICROORGANISMS ;(U) MATHEMATICAL MODELS ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 AGENCY ACCESSION	2 DATE OF SUMMARY	REPORT CONTROL SYMBOL
DAOG0698	01 OCT 81	FHP24C

3 DATE PREV SUM RY	4 KIND OF SUMMARY	5 SUMMARY SCTY	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION INSTR	8b SPECIFIC DATA - CONTRACTOR ACCESS	9 LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	YES ☒ NO ☐	A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a PRIMARY	62720A	3E162720A835	AA	146
b CONTRIBUTING				
c CONTRIBUTING				

11 TITLE (Precede with Security Classification Code)

(U) CHEMICAL FATE OF MILITARY COMPOUNDS

12 SCIENTIFIC AND TECHNOLOGICAL AREAS *

007800 HYG SANITATION 010100 MICROBIOLOGY 012700 PHYS CHE

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY	16 PERFORMANCE METHOD
OCT 79	CONT	DA	C. IN-HOUSE

17 CONTRACT/GRANT

a DATES EFFECTIVE — EXPIRATION

b NUMBER *

c TYPE

d AMOUNT

e KIND OF AWARD — F. CUM/TOT: $ 0

18 RESOURCES ESTIMATE	a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
FISCAL YEAR PRECEDING 1981	1.6	$ 158
FISCAL YEAR CURRENT 1982	0.4	$ 41

19 RESPONSIBLE DOD ORGANIZATION 407838 2406

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20 PERFORMING ORGANIZATION 407838 2406

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SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME MITCHELL, WR

NAME

21 GENERAL USE

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code) (U) MUNITIONS ;(U) ENVIRONMENTAL FATE;(U) BIODEGRADATION ;(U) HYDROLYSIS ;(U) PROTOLYSIS ;

23 TECHNICAL OBJECTIVE * 24 APPROACH 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) THE OBJECTIVE IS TO DETERMINE THE CHEMICAL DEGRADATION AND BIODEGRADATION RATE CONSTANTS FOR USE IN A MATHEMATICAL MODEL FOR PREDICTION OF THE ENVIRONMENTAL FATE OF CHEMICAL POLLUTANTS OF IMPORTANCE TO ARMY MUNITIONS PRODUCTION.

APPROACH: (U) THE RATE OF CHEMICAL DEGRADATION OF SELECTED COMPOUNDS VIA PHOTOLYTIC, HYDROLYTIC AND OXIDATIVE PATHWAYS WILL BE DETERMINED. THE RATE OF MICROBIAL DEGRADATION WILL BE DETERMINED. THE RATE OF MICROBIAL DEGRADATION WILL BE DETERMINED BY USING MICROORGANISMS ENDOGENOUS TO THE SITE OF POLLUTION. IDENTIFICATION OF TRANSFORMATION PRODUCTS WILL BE ATTEMPTED. ADSORPTION TO SEDIMENTS AND BIOSORPTION TO SELECTED MICROORGANISMS WILL BE MEASURED.

PROGRESS: (U) 8010 - 8109. 1,3-DINITROBENZENE; 1,3,5-TRINITROBENZENE AND 3,5-DINITROANILINE WERE SYNTHESIZED, PURIFIED AND METHOD DEVELOPED FOR THEIR ANALYSIS. THE TWO FORMER COMPOUNDS ARE VERY SLOW TO PHOTODEGRADE IN WATER AND ALL THREE ARE STABLE TO HYDROLYSIS. A NEW METHOD TO MEASURE THE VOLATILITY OF THESE SUBSTANCES WAS DEVELOPED AND VOLATILITY OF 1,3 DINITROBENZENE, 1,3,5-TRINITROBENZENE, AND 3,5-DINITROANILINE WAS DETERMINED. BIODEGRADATION STUDIES FOR 1,3-DINITROBENZENE, 1,3,5-TRINITROBENZENE, AND 3,5-DINITROANILINE HAVE BEEN COMPLETED AND DOCUMENTATION IS BEGINNING.

*Available to contractors upon originators approval

PROCESSING DATE: 30 NOV 81

DD FORM 1 MAY 68 1498M DTIC FORMAT 850

DETAIL SHEET

TITLE: Chemical Fate of Military Compounds

FUNDING HISTORY: PY - 0; CY - 158K; BY - 41K

PROBLEM DEFINITION: The objective is to determine the chemical degradation and biodegradation rate constants for use in a mathematical model for prediction of the environmental fate of chemical pollutants of importance to Army munitions production.

IMPORTANCE: Like other chemicals, the wastes resulting from the munitions manufacturing and loading processes could be subjected to federal discharge regulations. TNT (2,4,6-trinitrotoluene) and RDX (1,2,5-trinitrohexdydro 1,3,5-triazine) are manufactured at Army munitions facilities and are discharged with associated waste chemicals without significant treatment. Since wastewaters from munitions manufacturing facilities are released to the environment and since the chemical compounds contained in the wastes have the potential to affect health, it is important to define the overall environmental fate of these chemicals.

APPROACH: The rate of chemical degradation of selected compounds via photolytic, hydrolytic and oxidative pathways will be determined. The rate of microbial degradation will be determined by using microorganisms endogenous to the site of pollution. Identification of transformation products will be attempted. Adsorption to sediments and biosorption to selected microorganisms will be measured.

ACHIEVEMENTS: 1,3-Dinitrobenzene; 1,3,5-trinitrobenzene and 3,5-dinitroaniline were synthesized, purified and methods developed for their analysis. The two former compounds are very slow to photodegrade in water and all three are stable to hydrolysis. A new method to measure the volatility of these substances was developed and volatility of 1,3-dinitrobenzene was determined. A culture was developed which would use 1,3-dinitrobenzene as a sole carbon source, and the second order rate constant for its biodegradation was determined. 1,3,5-trinitrobenzene and 3,5-dinitroaniline would not act as sole carbon sources and appeared to be cometabolized in the presence of exogenous methabolizable nutrients. One product was recovered after the microbiological transformation of 1,3,5-trinitrobenzene and at least resulted from the transformation of the aniline compound.

RELATIONSHIP TO CORE PROGRAM: This research is a part of the Army's evaluation of the health and environmental consequences of munitions manufacture carried out by military activities.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) AQUATIC ORGANISMS ;(U) PHYSICOCHEMICAL PROPERTIES ;(U) MINNOWS ;(U) LABORATORY TESTS ;(U) BIODETERIORATION ;(U) WORK ;(U) VOLATILITY ;(U) TOXICOLOGY ;(U) TOXICITY ;(U) SOLUBILITY ;(U) SEDIMENTS

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0G5852	01 OCT 81	FHP24C

3. DATE PREV SUM BY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8a. DISTRIBUTION INSTR	8b. SPECIFIC DATA - CONTRACTOR ACCESS YES ☒ NO ☐	9. LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL		A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	149
b. CONTRIBUTING				
c. CONTRIBUTING				

11. TITLE (Precede with Security Classification Code)

(U) ENVIRONMENTAL FATE STUDIES OF 2,4,6-TRICHLOROANILINE

12. SCIENTIFIC AND TECHNOLOGICAL AREAS

005900 ENVIR BIOLOGY 012100 ORG CHEM 012700 PHYS CHE

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
OCT 80	SEP 82	DA	C. IN-HOUSE

17. CONTRACT/GRANT

a. DATES EFFECTIVE
b. NUMBER
c. TYPE
d. AMOUNT
e. KIND OF AWARD
f. CUM/TOT: $ 0

18. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (in Thousands)
FISCAL YEAR PRECEDING 1981	1.8	$ 163
FISCAL YEAR CURRENT 1982	1.5	$ 215

19. RESPONSIBLE DOD ORGANIZATION: 407838 2406

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RESPONSIBLE INDIVIDUAL

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20. PERFORMING ORGANIZATION: 407838 2406

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TELEPHONE: 3016632014

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME: DENNIS, W.H.; KENYON, K.F.

NAME: VAN DER SCHALIE, W.H.

21. GENERAL USE

21A. B. C. D. E.

22. KEYWORDS (Precede EACH with Security Classification Code): (U) 2,4,6-TRICHLOROANILINE ;(U) ENVIRONMENTAL FATE;(U) TOXICITY TO FISH ;(U) TOXICOLOGY

23. TECHNICAL OBJECTIVE • 24. APPROACH 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO DETERMINE SELECTED PHYSICOCHEMICAL PROPERTIES AND ASPECTS OF MICROBIOLOGICAL DEGRADATION OF 2,4,6-TRICHLOROANILINE, AND TO INVESTIGATE ITS ACUTE TOXICITY TO DAPHNIDS AND TO ONE SPECIES OF FISH. THIS CHEMICAL SUBSTANCE HAS BEEN FOUND AS AN ENVIRONMENTAL CONTAMINANT IN ASSOCIATION WITH PAST INDUSTRIAL OPERATIONS AT ABERDEEN PROVING GROUND (EDGEWOOD AREA), MARYLAND, AND IS BEING STUDIED IN RESPONSE TO A REQUEST FROM THE U.S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY.

APPROACH: (U) LABORATORY TESTS WILL BE CARRIED OUT ON 2,4,6-TRICHLOROANILINE TO DETERMINE VARIOUS PHYSICOCHEMICAL PROPERTIES, SUCH AS VOLATILITY, SOLUBILITY, PHOTODEGRADABILITY, AND OCTANOL-WATER PARTITION COEFFICIENT.

PROGRESS: (U) 8010 - 8109. THE SOLUBILITY OF 2,4,6-TCA IN WATER IS 46 MG/L (32 DEGREES C), 32 MG/L (19 DEGREES C) AND 22 MG/L (10 DEGREES C). IT HAS A UV MAX AT 245 NM AND 306 NM. 2 4,6-TCA UNDERGOES PHOTOLYSIS IN SUNLIGHT TO PRODUCE AT LEAST FOUR PRODUCTS WHICH ARE C1 AND OH SUBSTITUTED PHENAZINES. A 20 MG/L SOLUTION OF 2,4,6-TCA UNDERGOES NEARLY COMPLETE CONVERSION TO PHOTOLYSIS PRODUCTS WITHIN 48 HOURS OF EXPOSURE TO SUNLIGHT (JULY). THE OCTANOL/WATER PARTITION COEFFICIENT DETERMINED BY HPLC WAS 2.4X10 SUPERSCRIPT 3; AS DETERMINED DIRECTLY, IT WAS 3.5X10 SUPERSRIPT 3 (PH 9). A SAMPLE OF MUD TAKEN FROM CANAL CREEK IN THE EDGEWOOD AREA OF ABERDEEN PROVING GROUNDS CONTAINED 22 UG OF N,N' BIS(TRICHLOROPOHENYL) UREA PER GRAM OF AIR-DRIED MUD; TRICHLOROANILINE WAS NOT FOUND.

*Available to contractors upon originators approval

PROCESSING DATE: 08 JAN 82

DD FORM MAY 88 1498M DTIC FORMAT 850 PAGE 60

DETAIL SHEET

TITLE: (U) Environmental Fate Studies of 2,4,6-Trichloroaniline

FUNDING HISTORY: PY - 0; CY - 163; BY - 215

PROBLEM DEFINITION: The US Army Toxic and Hazardous Materials Agency had reported the occurrence of 2,4,6-trichloroaniline (TCA) in sediments of a small canal leading to the Gunpowder River, and in the river itself, in the vicinity of Aberdeen Proving Ground (APG). The present study was intended to provide basic information useful in predicting TCA's environmental fate.

IMPORTANCE: TCA was believed to be a major sediment contaminant resulting from past military industrial operations in the Edgewood Arsenal area of APG. As such, information was needed to permit prediction of TCA's impact on the ecology and on the health of humans exposed to TCA through the food chain.

APPROACH: Laboratory tests were to be carried out on TCA to determine physical-chemical properties, subh as photodegradability, solubility, volatility, octanol-water partition coefficient and soil-water equilibria.

ACHIEVEMENTS: TCA solubility in water (mg/L, $T^{o}C$) is: 22,10; 32,19; 46,32. UV maxima at 245 and 306 um. Sunlight photolysis gives four or more phenazine derivatives; conversion of 20 mg/L is complete in 48 hours of exposure (July). K_{ow} = 2400 by HPLC; 3500 by direct measurement. Sediments contained no TCA, but did contain a TCA precursor (a urea) that decomposed to TCA and 2,4,6-trichlorophenyl isocyanate at the injection port of a GC column.

RELATIONSHIP TO CORE PROGRAM: Environmental fate studies are currently being conducted both intra- and extra-murally at USAMBRDL for both hazardous compounds and munitions discharges.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) FILMS ;(U) FIRE FIGHTING ;(U) FOAM ;(U) LIQUIDS ;(U) NAVY ;(U) REVERSE OSMOSIS ;(U) SCHOOLS ;(U) SITES ;(U) ULTRAFILTRATION ;(U) WASTE WATER

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

				DAOG6775	30 SEP 81		FHK53E
06 FEB 81	K. COMPLETION	U	U		NL	☑ YES ☐ NO	A. WORK UNIT
NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
	62720A	3E162720A835		AA	150		

(U) UF-RO SYSTEM FOR AFFF RECOVERY: TEST AND EVALUATION

007800 HYG SANITATION 003300 CHEM ENGR

FEB 81	SEP 81	DA		C. IN-HOUSE	
		RESOURCES ESTIMATE	PROFESSIONAL MAN YRS	FUNDS (in Thousands)	
EXPIRATION		PRECEDING FISCAL YEAR 1981	0.3	$ 14	
AMOUNT		CURRENT FISCAL YEAR 1982	0.0	$ 0	
F. CUM/TOT:	$ 0				

407838	2406	407838	2406

NAME: MDRDC MEDICAL BIOENGINEERING R+D LAB
ADDRESS: FT DETRICK MD 21701

NAME: MDRDC MEDICAL BIOENGINEERING R+D LAB
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TELEPHONE: 3016637207
SOCIAL SECURITY ACCOUNT NUMBER:

GENSLER, J.D.
3016632014

ASSOCIATE INVESTIGATORS
NAME: KOBYLINSKI, E.A.
NAME:

21A. B. C. D. E.

(U) AFFF ;(U) ENVIRONMENT ;(U) ULTRAFILTRATION ;(U) REVERSE OSMOSIS ;

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) THE PURPOSE OF THIS EFFORT IS TO FABRICATE AN ULTRAFILTRATION - REVERSE OSMOSIS (UF-RO) SYSTEM TO BE TESTED FOR REMOVAL AND RECOVERY OF AFFF FROM FIREFIGHTING WASTEWATERS. THE US NAVY OPERATES FIREFIGHTING SCHOOLS FOR THE TRAINING OF PERSONNEL FROM ALL SERVICES. AFFF IN THE WASTEWATERS INTERFERES WITH OPERATION OF TREATMENT PLANTS, AND IS TOXIC TO MARINE LIFE.

APPROACH: (U) THE PILOT UF-RO SYSTEM WILL BE FABRICATED FROM EXISTING UNITS AT FORT DETRICK, THEN TESTED AND EVALUATED AT A SELECTED NAVY SITE FOR ITS TECHNICAL AND ECONOMICAL FEASIBILITIES FOR RECOVERY OF AQUEOUS FILM-FORMING FOAM (AFFF).

PROGRESS: (U) 8102 - 8109. EQUIPMENT HAS BEEN FABRICATED. TESTING WILL BEGIN AT NAVY SITE SHORTLY (BY NAVY).

PROCESSING DATE: 30 NOV 81

DD FORM 1498M DTIC FORMAT 850 PAGE 10

REPORT NO. FHK53E UNCLASSIFIED

DETAIL SHEET

TITLE: UF-RO System for AFFF Recovery: Test and Evaluation

FUNDING HISTORY: PY - 0; CY - 14; BY - 0

PROBLEM DEFINITION: The purpose of this effort is to fabricate an ultrafiltration - reverse osmosis (UF-RO) system to be tested for removal and recovery of aqueous film-forming foam (AFFF) from firefighting wastewaters.

IMPORTANCE: The US Navy operates firefighting schools for the training of personnel from all uniform services. AFFF in the wastewaters interferes with operation of treatment plants, and is toxic to marine life.

APPROACH: The pilot UF-RO system will be fabricated from existing units at Fort Detrick, then tested and evaluated at a selected navy site for its technical and economical feasibilities for recovery of AFFF.

ACHIEVEMENTS: Equipment has been fabricated. Testing by navy will begin at San Diego in 1982.

RELATIONSHIP TO CORE PROGRAM: This research is part of the Army's effort in water pollution hazard assessment, source reduction, control, and treatment technology.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) AMMUNITION ;(U) ARMY OPERATIONS ;(U) BIODETERIORATION ;(U) PHYSICAL CHEMISTRY;(U) POLLUTANTS ;(U) SEDIMENTS ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
DAOG1297	01 OCT 81	FHP24C

3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8a. DISTRIBUTION INSTR	8b. SPECIFIC DATA	9. LEVEL OF SUM
23 JUL 81	D. CHANGE	U	U		NL	[X] CONTRACTOR ACCESS YES [ ] NO	A. WORK UNIT

10. NO./CODES:*	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	152
b. CONTRIBUTING				
c. CONTRIBUTING				

11. TITLE (Precede with Security Classification Code)

(U) ENVIRONMENTAL FATE OF 2,4,6-TRICHLORANILINE: MICROBIAL INTERACTIONS

12. SCIENTIFIC AND TECHNOLOGICAL AREAS:

010100 MICROBIOLOGY 008300 INORG CHEM 012700 PHYS CHE

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
JUN 81	MAR 82	DA	C. IN-HOUSE

17. CONTRACT/GRANT

a. DATES EFFECTIVE: EXPIRATION:
b. NUMBER:
c. TYPE: d. AMOUNT:
e. KIND OF AWARD: F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR PRECEDING 1981	0.2	$ 18
FISCAL YEAR CURRENT 1982	0.2	$ 18

19. RESPONSIBLE DOD ORGANIZATION: 407838 2406

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RESPONSIBLE INDIVIDUAL

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SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME

NAME

21. GENERAL USE

21A. B. C. D. E.

22. KEYWORDS (Precede EACH with Security Classification Code) (U) ENVIRONMENTAL FATE;(U) BIODEGRADATION ;(U) MUNITIONS ;(U) PHYSICAL CHEMISTRY;

23. TECHNICAL OBJECTIVE; 24. APPROACH; 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) THE POSSIBLE BIODEGRADATION OF 2,4,6-TRICHLOROANILINE, AN ARMY MUNITIONS POLLUTANT, WILL BE DETERMINED. IF BIODEGRADATION IS FOUND, THEN BIOTRANSFORMATION RATES WILL BE DETERMINED.

APPROACH: (U) THE SUSCEPTIBILITY OF 2,4,6-TRICHLOROANILINE TO BIODEGRADATION WILL BE DETERMINED BY SCPEENING PROCEDURES USING SEDIMENTS AND MICROORGANISMS INDIGENOUS TO THE POLLUTION SITE. IF SCREENING PROCEDURES REVEAL BIODEGRADATION, THE RATES WILL BE MEASURED AND BIOSORPTION AND BIOTRANSFORMATION PRODUCTS WILL BE MEASURED.

PROGRESS: (U) 8104 - 8109. PRIMARY AEROBIC SCREENING FOR 2,4,6-TRICHLOROANILINE HAS BEEN COMPLETED AND SHOWS THE OCCURRENCE OF A SLIGHT DECREASE IN THE CONCENTRATION OF THE CHEMICAL WITH TIME IN ENVIRONMENTAL SAMPLES. METHODOLOGY FOR ANAEROBIC SCREENING HAS BEEN ASSEMBLED AND IS BEING TESTED.

(Have been in contractors hands or grantors approval)

PROCESSING DATE: 30 NOV 81

DD FORM 1 MAY 80 1498M DTIC FORMAT 850 PAGE 40

DETAIL SHEET

TITLE: (U) Environmental Fate of 2,4,6-Trichloroaniline: Microbial Interactions

FUNDING HISTORY: PY - 0; CY - 18; BY - 18

PROBLEM DEFINITION: Wastes from manufacturing and laundering operations involving the chemical 2,4,6-trichloroaniline (TCA) were discharged into the Canal Creek at the Aberdeen Proving Ground from World War II until the 1960s. Chemical analysis of river sediments from the Gunpowder Neck Region of the Aberdeen Proving Ground have led to estimates that from 15 to 20 square miles of the area are contaminated with the pollutant.

IMPORTANCE: Should it be necessary to perform a risk assessment for TCA, it is the Army's responsibility to provide the data base for that assessment. Toward that end, microbial interactions with the compound are being studied as an integral part of Environmental Fate research at USAMBRDL.

APPROACH: The susceptibility of TCA to biodegradation will be determined by aerobic and anaerobic screening procedures using microorganisms indigenous to the pollution site. Should biodegradation take place, attempts will be made to utilize the compound as a growth substrate and to measure the rate of its microbial degradation. Bioadsorption studies will be conducted with stock cultures of environmentally significant microorganism.

ACHIEVEMENTS: Preliminary results of aerobic screening for TCA biodegradation indicate that the compound is degraded by microbial action. Methodology for anaerobic screening has been assembled and is being tested. Bioadsorption studies are complete and indicate that bioadsorption should not be a major factor in the environmental fate of the compound.

RELATIONSHIP TO CORE PROGRAM: Environmental fate studies are currently being conducted both intra- and extra-murally at USAMBRDL for both hazardous compounds and munitions discharges.

CARE OF COMBAT CASUALTY

RETRIEVAL TERMS ASSIGNED BY DTIC (U) BLOOD STORAGE ;(U) REFRIGERATION SYSTEMS ;(U) INVENTORY ;(U) WORK

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 DATE PREV SUM RY: 01 OCT 80	4 KIND OF SUMMARY: D. CHANGE	5 SUMMARY SCTY: U	6 WORK SECURITY: U	7 REGRADING:	8a DISTRIBUTION INSTR: NL	8b SPECIFIC DATA: CONTRACTOR ACCESS YES [X] NO [ ]	9 LEVEL OF SUM: A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a PRIMARY	62772A	3S162772A874	BA	221
b CONTRIBUTING				
c CONTRIB * NO				

AGENCY ACCESSION: DA0G0652 | 2 DATE OF SUMMARY: 01 OCT 81 | REPORT CONTROL SYMBOL: FHP24C

11 TITLE (Precede with Security Classification Code):

(U) REFRIGERATOR, MEDICAL, FIELD

12 SCIENTIFIC AND TECHNOLOGICAL AREAS:

009800 MED HOSP EQ 002400 BIOENGINEERING

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY	16 PERFORMANCE METHOD
OCT 79	SEP 82	DA	C. IN-HOUSE

17 CONTRACT/GRANT:
a DATES EFFECTIVE: EXPIRATION:
b NUMBER:
c TYPE:
d AMOUNT:
e KIND OF AWARD:
f. CUM/TOT: $ 0

18 RESOURCES ESTIMATE	PRECEDING	a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
FISCAL YEAR	1981	0.4	$ 31
	CURRENT 1982	0.3	$ 28

19a RESPONSIBLE DOD ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

RESPONSIBLE INDIVIDUAL
NAME: HAMES, W H
TELEPHONE: 3018637277

20 PERFORMING ORGANIZATION: 407838 2406

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ADDRESS: FT DETRICK MD 21701

PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)
NAME: O CONNOR, RJ
TELEPHONE: 3018637237
SOCIAL SECURITY ACCOUNT NUMBER:

ASSOCIATE INVESTIGATORS
NAME: CONWAY, WH
NAME:

21 GENERAL USE:

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code): (U) BIOLOGICAL STORAGE;(U) BLOOD STORAGE ;(U) BIOLOGICAL REFRIGERATOR ;(U) MEDICAL REFRIGERATOR ;

23 TECHNICAL OBJECTIVE, 24 APPROACH, 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code):

OBJECTIVE:(U) TO IDENTIFY A REPLACEMENT ITEM FOR THE BIOLOGICAL REFRIGERATOR CURRENTLY IN THE INVENTORY (NSN 4110-00-707-2550) WHICH IS NO LONGER SUPPORTABLE.

APPROACH: (U) AN EFFORT WILL BE MADE TO LOCATE A SUITABLE COMMERCIALLY PRODUCED ITEM THAT WILL SATISFY REQUIREMENTS OR THAT CAN BE MADE TO DO SO WITH MINOR MODIFICATION. SHOULD THAT EFFORT FAIL, WHICH IS UNLIKELY, A NEW DEVELOPMENT EFFORT WILL BE UNDERTAKEN - PROBABLY ON CONTRACT.

PROGRESS: (U) 8010 - 8109. AFTER COMPLETING A MARKET SURVEY OF AVAILABLE CANDIDATES WITH MARGINAL SUCCESS, CONSIDERATION WAS GIVEN TO AN UPGRADING OF THE EXISTING UNIT THAT WOULD MAKE IT SUPPORTABLE AGAIN. PRIOR TO MAKING A DECISION ON THIS, A RECONFIRMATION EFFORT ON ACTUAL REQUIREMENTS IS BEING DONE IN CONCERT WITH THE COMBAT DEVELOPER.

*Available to contractors upon originators approval

PROCESSING DATE: 30 NOV 81

DD FORM 1 MAY 68 1498M DTIC FORMAT 850 PAGE 25

DETAIL SHEET

TITLE: (U) Refrigerator, Medical, Field

FUNDING HISTORY: PY - 11K; CY - 31K; BY - 28K

PROBLEM DEFINITION: The biological refrigerator currently in the inventory (NSN 4110-00-707-2550) is said to be no longer supportable, primarily due to high acquisition cost.

IMPORTANCE: A refrigerator for the storage of perishable medical supplies is a necessity for field military units. The special requirements brought about by the need to store such things as whole blood and the rugged operating environment eliminate a great many commercially available units from consideration.

APPROACH: To canvas the commercial market for a machine that meets the required performance characteristics and which can be ruggedized to meet environmental and handling requirements. At the same time, consideration is to be given to reengineering of the current design to modernize it and make it more easily and cheaply procurable.

ACHIEVEMENTS: Specimens of two potential commercial units were procured and evaluated. Also procured a full drawing set for the old military model and gave consideration to updating the design to make it supportable. Prior to making a decision on this, a reconfirmation of requirements is being conducted with the Combat Developer.

RELATIONSHIP TO CORE PROGRAM: This task is consistent with the Laboratory's mission to develop equipment specific to field medical requirements.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) COMMERCIAL EQUIPMENT ;(U) SURGICAL INSTRUMENTS ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION: DA0G0851	2. DATE OF SUMMARY: 01 OCT 81		REPORT CONTROL SYMBOL: FHP24C
3. DATE PREV SUM'RY: 01 OCT 80	4. KIND OF SUMMARY: D. CHANGE	5. SUMMARY SCTY: U	6. WORK SECURITY: U	7. REGRADING:	8a. DISTRIBUTION INSTR: NL	8b. SPECIFIC DATA: CONTRACTOR ACCESS YES ☒ NO ☐	9. LEVEL OF SUM: A. WORK UNIT
10. NO./CODES:*	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
a. PRIMARY:	62772A	3S162772A874		BA	222		
c. CONTRIBUTING:							
d. CONTRIBUTING:							

11. TITLE (Precede with Security Classification Code):

(U) STERILIZER, SURGICAL INSTRUMENT AND DRESSING

12. SCIENTIFIC AND TECHNOLOGICAL AREAS:

009800 MED HOSP EQ 002400 BIOENGINEERING

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY			16. PERFORMANCE METHOD
OCT 79	SEP 82	DA			C. IN-HOUSE

17. CONTRACT/GRANT:

a. DATES EFFECTIVE: EXPIRATION:
b. NUMBER:
c. TYPE: d. AMOUNT:
e. KIND OF AWARD: F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE		a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	0.3	$ 25
	CURRENT 1982	0.2	$ 21

19. RESPONSIBLE DOD ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

RESPONSIBLE INDIVIDUAL

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20. PERFORMING ORGANIZATION: 407838 2406

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NAME: PRENSKY, W

TELEPHONE: 3018637237

SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME: CONWAY, WH

NAME:

21. GENERAL USE

21A. B. C. D. E.

22. KEYWORDS (Precede EACH with Security Classification Code): (U) STERILIZER, FIELD ;(U) STERILIZER, DENTAL;(U) STERILIZER, VETERINARY ;(U) STERILIZER, SMALL

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO IDENTIFY A SMALL TABLE-TOP STERILIZER TO REPLACE NSN 6500-00-782-6503, NSN 6500-00-926-4857 AND NSN 6530-00-926-2022 WHICH ARE NO LONGER SUPPORTABLE.

APPROACH: (U) TO CANVASS THE MARKET FOR A COMMERCIAL ITEM THAT IS SUITABLE OR THAT CAN BE MADE SO BY MINOR MODIFICATION. IF THIS APPROACH SHOULD FAIL, A NEW DEVELOPMENT IS CONTEMPLATED.

PROGRESS: (U) 8010 - 8109. ONE COMMERCIAL ELECTRICALLY POWERED STERILIZER UNIT WAS EVALUATED AND FOUND EFFECTIVE. THE TASK HAS BEEN PLACED IN A HOLDING STATUS, HOWEVER, DUE TO A REEVALUATION OF BATTALION AID STATION REQUIREMENTS BEING PERFORMED BY THE COMBAT DEVELOPER.

*Available to contractors upon originators approval

PROCESSING DATE: 30 NOV 81

DD FORM MAY 88 1498M DTIC FORMAT 850 PAGE 24

DETAIL SHEET

TITLE: (U) Sterilizer, Surgical Instrument and Dressing

FUNDING HISTORY: PY - 14K; CY - 25K; BY - 21K

PROBLEM DEFINITION: Three small tabletop sterilizers for field use (NSN 6530-00-782-6503, 6530-00-926-4857 and 6530-00-926-2022) are of aging designs and are no longer supportable. These units serve aid stations, field dental facilities, field laboratories and the like. A need exists for a single small sterilizer, supportable in a field environment, to replace these obsolete units.

IMPORTANCE: A sterilization capability in small field medical elements such as those mentioned above is an evident necessity. The substitution of a single satisfactory item for the three separate units currently in stock will greatly improve the logistical support situation relative to this class of equipment while simultaneously allowing a move up to current technology.

APPROACH: To canvas the commercial market for an item that is suitable or can be made so by minor modification. Failing this, a new development would be undertaken.

ACHIEVEMENTS: A preliminary evaluation was conducted on one commercial electrically powered unit and the results were promising. The Combat Developer advises, however, that sterilizer requirements relative to the Battalion Aid Station are undergoing study and probable revision. Since that application is of paramount importance in selection of a design, this task is now being held in abeyance pending the outcome of that review process.

RELATIONSHIP TO CORE PROGRAM: This task falls in the realm of the Laboratory's mission to provide equipment to support the practice of medicine and dentistry in a field environment.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) BLOOD PRESSURE ;(U) ARMORED VEHICLES ;(U) WORK ;(U) ULTRASONICS ;(U) RESPIRATION ;(U) RATES ;(U) NOISE ;(U) BODY TEMPERATURE

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 AGENCY ACCESSION	2 DATE OF SUMMARY	REPORT CONTROL SYMBOL
DAOG5858	01 OCT 81	FHP24C

3 DATE PREV SUM	4 KIND OF SUMMARY	5 SUMMARY SCTY	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION INSTR	8b SPECIFIC DATA	9 LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	CONTRACTOR ACCESS YES [X] NO [ ]	A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62772A	3S162772A874	BA	224
b. CONTRIB ING				
c. CONTRIB ING				

11. TITLE (Precede with Security Classification Code)

(U) VITAL SIGNS MONITOR FOR HIGH NOISE/VIBRATION ENVIRONMENT

12. SCIENTIFIC AND TECHNOLOGICAL AREAS

009800 MED HOSP EQ 002400 BIOENGINEERING

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY		16 PERFORMANCE METHOD
OCT 80	OCT 85	DA		C. IN-HOUSE

17 CONTRACT/GRANT

a. DATES EFFECTIVE
b. NUMBER
c. TYPE
d. AMOUNT
e. KIND OF AWARD
f. CUM/TOT: $ 0

18 RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR PRECEDING 1981	0.4	$ 28
FISCAL YEAR CURRENT 1982	0.6	$ 44

19 RESPONSIBLE DOD ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

ADDRESS: FT DETRICK MD 21701

RESPONSIBLE INDIVIDUAL

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ASSOCIATE INVESTIGATORS

NAME: CONWAY, W.H.

21 GENERAL USE

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code)

(U) VITAL SIGNS ;(U) BLOOD PRESSURE ;(U) PULSE ;(U) RESPIRATION RATE ;(U) BODY TEMPERATURE

23 TECHNICAL OBJECTIVE - 24 APPROACH 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO DEVELOP AN EQUIPMENT SET THAT PROVIDES THE CAPABILITY TO MONITOR MEDICAL VITAL SIGNS OF PATIENTS IN A HIGH NOISE OR HIGH VIBRATION LEVEL ENVIRONMENT. PRINCIPAL USE WILL BE IN ARMORED VEHICLES AND HELICOPTERS FUNCTIONING AS BATTLEFIELD AMBULANCES. TRADITIONAL METHODS OF MEASURING VITAL SIGNS CANNOT BE USED IN SUCH AN ENVIRONMENT.

APPROACH: (U) INVESTIGATE NEW COMMERCIAL DEVELOPMENTS IN NEW TECHNIQUES, SUCH AS ULTRASONICS, ELECTRONIC ARTIFACT REJECTION, ETC., AND DETERMINE THEIR SUITABILITY FOR THE PROBLEM AREA OF CONSIDERATION. IF NOTHING SUITABLE EXISTS, ATTEMPT TO DEVELOP NEW TECHNIQUES IN-HOUSE OR IN COLLABORATION WITH THE PRIVATE SECTOR. ULTIMATE GOAL OF THIS TASK IS TO PROVIDE A FAMILY OF VITAL SIGNS MONITORS FOR THE PROBLEM ENVIRONMENT.

PROGRESS: (U) 8010 - 8109. A VARIETY OF COMMERCIAL VITAL SIGNS MONITORS HAVE BEEN TESTED, ENCOMPASSING AUSCULATORY AND OSCILLOMETRIC BLOOD PRESSURE TECHNIQUES AND VARIOUS ELECTRONIC SCHEMES FOR ARTIFACT REJECTION. ALL HAVE FAILED TO PERFORM IN THE HARSH ENVIRONMENT OF AN M113 ARMORED PERSONNEL CARRIER. AN EFFORT IS BEING MADE TO OBTAIN AN ULTRASONIC BLOOD PRESSURE UNIT IN HOPES THAT IT MAY OVERCOME THE ARTIFACT PROBLEM. DISCUSSION IS ALSO BEING CARRIED ON WITH PROFESSIONAL CONSULTANTS CONCERNING THE MINIMUM AMOUNT OF DATA THAT COULD PROVIDE MEDICALLY USEFUL INFORMATION WITHOUT OVERTAXING THE ABILITY OF EQUIPMENT TO READ THE DATA.

*Avail to contractors upon originators approval

PROCESSING DATE: 06 JAN 82

DD FORM 1 MAY 68 1498M DTIC FORMAT 850 PAGE 62

DETAIL SHEET

TITLE: (U) Vital Signs Monitor for High Noise/Vibration Environment

FUNDING HISTORY: PY - 0; CY - 28K; BY - 44K

PROBLEM DEFINITION: The ability to quantitatively measure the vital signs of a combat casualty in the high noise, high vibration environment of a moving tactical ambulance is needed. This is particularly difficult to achieve in tracked vehicles moving across unpaved terrain, and the common methods of measuring heart rate, blood pressure, etc., are probably not adequate.

IMPORTANCE: Current scenarios for future combat predict that casualties being transported by tactical ground ambulances will spend much more time in transit. This situation mandates that treatment capabilities in these vehicles be upgraded. The ability to adequately measure vital signs of the patient is fundamental to that upgraded treatment.

APPROACH: To evaluate the efficacy of existing technology when applied to this problem and to seek new techniques where existing ones are not adequate.

ACHIEVEMENTS: Specimen instruments employing the ausculatory and oscillometric methods of blood pressure measurement have been tested in an M113 vehicle. These instruments, employing a number of different artifact rejection schemes, have all failed to perform. A specimen instrument that uses ultrasound is being obtained for test.

RELATIONSHIP TO CORE PROGRAM: This task is consistent with the mission of this Laboratory to develop field medical equipment.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) FIELD EQUIPMENT ;(U) MEDICAL SERVICES ;(U) MEDICAL EQUIPMENT ;(U) WHOLE BODY IRRADIATION ;(U) *X RAY DIAGNOSTICS ;(U) FLYING SPOT SCANNERS ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 AGENCY ACCESSION	2 DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0B6172	01 OCT 81	FHP24C

3 DATE PREV SUM RY	4 KIND OF SUMMARY	5 SUMMARY SCTY	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION INSTR	8b SPECIFIC DATA	9 LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	CONTRACTOR ACCESS YES ☒ NO ☐	A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a PRIMARY	62772A	3S162772A874	BA	225
b CONTRIBUTING				
c CONTRIBUTING				

11 TITLE (Precede with Security Classification Code)

(U) WHOLE BODY DIAGNOSTIC X-RAY SCANNER

12 SCIENTIFIC AND TECHNOLOGICAL AREAS

003500 CLIN MEDICINE 009800 MED HOSP EQ

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY	16 PERFORMANCE METHOD
FEB 76	SEP 83	DA	C. IN-HOUSE

17 CONTRACT/GRANT

a DATES EFFECTIVE — EXPIRATION

b NUMBER

c TYPE — d AMOUNT

e KIND OF AWARD — F. CUM/TOT: $ 0

18 RESOURCES ESTIMATE

		a PROFESSIONAL MAN YRS	b FUNDS (in Thousands)
FISCAL YEAR	PRECEDING 1981	0.6	$ 69
	CURRENT 1982	0.1	$ 8

19a RESPONSIBLE DOD ORGANIZATION 407838 2406

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NAME HAMES, W. H., LTC

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20 PERFORMING ORGANIZATION 407838 2406

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SOCIAL SECURITY ACCOUNT NUMBER

ASSOCIATE INVESTIGATORS

NAME

NAME

21 GENERAL USE

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code)

(U) WHOLE BODY ;(U) DIAGNOSTIC ;(U) X-RAY ;(U) SCANNER ;(U) FLYING SPOT ;(U) FIELD MEDICINE ;(U) FIELD EQUIPMENT ;

23 TECHNICAL OBJECTIVE, 24 APPROACH, 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO PROVIDE ENGINEERING ASSISTANCE IN EVALUATING NEW DIAGNOSTIC X-RAY SCANNERS BEING EVOLVED FOR MILITARY FIELD USE.

APPROACH: (U) PROFESSIONALLY EVALUATE AND ASSESS NEW EQUIPMENT AS REQUIRED.

PROGRESS: (U) 8010 - 8109. A CONTRACT HAS BEEN LET FOR THE DEVELOPMENT OF AN ELECTRONIC FLYING SPOT X-RAY SOURCE. SEVERAL TUBES HAVE BEEN FABRICATED WITH AN ELECTRON BEAM DEFLECTION SYSTEM EXTERNALLY PROVIDING VERTICAL AND HORIZONTAL SCANNING OF THE ANODE. HEAT AND GAS PROBLEMS HAVE LIMITED THE LIFE OF THESE EARLY MODELS. THE CONTRACTOR HAS CONSTRUCTED MODELS WITH LONGER LIFE BUT LOW BEAM CURRENT HAS PRECLUDED OBTAINNG A USEFUL RADIOGRAPHIC IMAGE.

*Available to contractors upon originators approval

PROCESSING DATE: 08 JAN 82

DD FORM 1498M MAY 68 DTIC FORMAT 850 PAGE 7

DETAIL SHEET

TITLE: (U) Whole Body Diagnostic X-Ray Scanner

FUNDING HISTORY: PY - 32K; CY - 69K; BY - 8K

PROBLEM DEFINITION: Currently available radiographic equipment requires high radiation exposure to obtain diagnostic quality radiographs. In addition, these systems require a large amount of support (chemicals, film, water, processors, etc.) as well as operator and patient shielding.

The technology exists which would permit diagnostic quality radiographs to be made with a reduction of the radiation exposure by a factor of 100.

IMPORTANCE: The importance of reducing patient and operator exposure to ionizing radiation is well documented. The elimination of the requirements for the ancillary support items (water, film, film processors, etc.) has a direct impact on support of field medicine.

APPROACH: A contract has been let for the development of an electronic flying spot X-ray source.

ACHIEVEMENTS: The contractor has a basic patent on an electronically scanned electron beam and pinhole collimator that should produce a flying spot of X-rays. Several models have been fabricated that do produce X-rays. Gas and heat problems have limited the beam current obtained.

RELATIONSHIP TO CORE PROGRAM: The program is directly related to the Laboratory's mission of developing field medical equipment.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) FIELD EQUIPMENT ;(U) COMMERCE ;(U) *SURGICAL SUPPLIES ;(U) HOSPITALS ;(U) *SINKS(PLUMBING FIXTURES);

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION: DA086206	2. DATE OF SUMMARY: 30 SEP 81		REPORT CONTROL SYMBOL: FHK53E
3. SAME PREV. SUMRY: 01 OCT 80	4. KIND OF SUMMARY: K. COMPLETION	5. SUMMARY SCTY: U	6. WORK SECURITY: U	7. REGRADING:	8a. DISTRIBUTION INSTR: NL	8b. SPECIFIC DATA: CONTRACTOR ACCESS YES [X] NO [ ]	9. LEVEL OF SUM: A. WORK UNIT
10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
a. PRIMARY:	62772A	3S162772A874		BA	226		
b. CONTRIBUTING:							
c. CONTRIBUTING:							

11. TITLE (Precede with Security Classification Code):

(U) SINK UNIT, SURGICAL, FIELD (NSN 6545-00-935-4056), ENGINEERING EVALUATION OF

12. SCIENTIFIC AND TECHNOLOGICAL AREAS:

002400 BIOENGINEERING 009800 MED HOSP EQ

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD
DEC 76	DEC 80	DA		C. IN-HOUSE

17. CONTRACT/GRANT:

a. DATES EFFECTIVE: EXPIRATION:

b. NUMBER:

c. TYPE: d. AMOUNT:

e. END OF AWARD: F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR PRECEDING 1981	0.5	$ 35
FISCAL YEAR CURRENT 1982	0.0	$ 0

19. RESPONSIBLE DOD ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

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RESPONSIBLE INDIVIDUAL:

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TELEPHONE: 3016637277

20. GENERAL USE:

21A. B. C. D. E.

20. PERFORMING ORGANIZATION: 407838 2406

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PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution.

NAME: CONWAY, W.H.

TELEPHONE: 3016637237

SOCIAL SECURITY ACCOUNT NUMBER:

ASSOCIATE INVESTIGATORS

NAME: CRAMPTON, K

NAME:

22. KEYWORDS (Precede EACH with Security Classification Code):

(U) SURGICAL SINK ;(U) SCRUB ;(U) FIELD EQUIPMENT ;(U) SURGICAL SCRUB ;

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code):

OBJECTIVE:(U) TO CONDUCT AN ENGINEERING EVALUATION OF THE FILED SURGICAL SINK TO DETERMINE FEASIBILITY OF CONDUCTING A PRODUCT IMPROVEMENT PROGRAM OR A NEED FOR A NEW PRODUCT DESIGN TO ELIMINATE FIELD COMPLAINTS.

APPROACH: (U) PREPARE A TESTING PROTOCOL BASED ON ACCRUED FIELD COMPLAINTS, CONDUCT AN IN HOUSE EVALUATION AND PREPARE AN ENGINEERING EVALUATION REPORT SO THAT A PROPER COURSE OF FUTURE ACTION CAN BE DETERMINED.

PROGRESS: (U) 8010 - 8109. A TRIAL MODIFICATION OF 40 SINK UNITS WAS COMPLETED AND DATA COMPILED ON THE UNIT COST AND TIME REQUIRED. ENGINEERING SKETCHES OF MODIFIED ITEMS WERE PREPARED. A MEETING WAS HELD WITH PERSONNEL OF DPSC AND USAMMA AT WHICH THE MODIFICATION PROCEDURE FOR EXISTING SINK UNITS WAS FINALIZED AND AGREED UPON. IT HAS BEEN DECIDED THAT THE MODIFICATION OF STOCKED SINK UNITS WILL BE ACCOMPLISHED BY THE APPROPRIATE DEPOTS. THUS, THIS LABORATORY'S INVOLVEMENT IS COMPLETE.

*Avail only to contractors upon originator's approval

PROCESSING DATE: 30 NOV 81

DD FORM 1498M MAY 68 DTIC FORMAT 850 PAGE 2

DETAIL SHEET

TITLE: (U) Sink Unit, Surgical, Field, Engineering Evaluation of

FUNDING HISTORY: PY - 41K; CY - 35K; BY - 0

PROBLEM DEFINITION: Numerous complaints from field medical units have been received citing problems with the Surgical Field Sink (NSN 6545-00-935-4056). The complaints deal with heater burnout and other problems. This task was undertaken to conduct an engineering evaluation of the item and determine whether a modification or a new development is necessary to correct the deficiencies.

IMPORTANCE: These sinks are used for surgical scrubbing in forward area medical units. Their high failure rate makes logistical support difficult and jeopardizes the mission of these medical units.

APPROACH: To identify the root causes of the high failure rate through extensive testing and analysis and to determine appropriate corrective action.

ACHIEVEMENTS: A modification, which addresses the principal problems with these units, was developed and tried on 40 sink units. The results of this effort have been turned over to USAMMA for implementation at the depot level.

RELATIONSHIP TO CORE PROGRAM: This task is consistent with the Laboratory's mission of providing development engineering on field medical equipment.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) WORK ;(U) STORAGE ;(U) PHYSICAL PROPERTIES ;(U) MEDICAL EQUIPMENT ;(U) LIGHTWEIGHT ;(U) CONTAINERS

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA086248	01 OCT 81	FHP24C

3. DATE PRE. SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8a. DISTRIBUTION INSTR	8b. SPECIFIC DATA: CONTRACTOR ACCESS YES ☒ NO ☐	9. LEVEL OF SUM
01 OCT 81	D. CHANGE	U	U		NL		A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62772A	3S162772A874	BA	228
b. CONTRIBUTING				
c. CONTRIBUTING				

11. TITLE (Precede with Security Classification Code)

(U) PROTECTIVE CONTAINERS, FIELD, MEDICAL DEVICES

12. SCIENTIFIC AND TECHNOLOGICAL AREAS:

002400 BIOENGINEERING 009800 MED HOSP EQ

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
DEC 78	SEP 85	DA	C. IN-HOUSE

17. CONTRACT/GRANT:

a. DATES EFFECTIVE: EXPIRATION:

b. NUMBER:

c. TYPE: d. AMOUNT:

e. END OF AWARD: F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE

		a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	1.1	$ 111
	CURRENT 1982	0.7	$ 85

19. RESPONSIBLE DOD ORGANIZATION: 407838 2406

NAME: MDRDC MEDICAL BIOENGINEERING R&D LAB

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20. PERFORMING ORGANIZATION: 407838 2406

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ASSOCIATE INVESTIGATORS

NAME: REAMS, W.H.

NAME:

21. GENERAL USE

21A. B. C. D. E.

22. KEYWORDS (Precede EACH with Security Classification Code)

(U) CONTAINER ;(U) PROTECTIVE CONTAINER ;

23. TECHNICAL OBJECTIVE; 24. APPROACH; 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO DESIGN A FAMILY OF STRONG, LIGHTWEIGHT CONTAINERS FOR FRAGILE MEDICAL EQUIPMENT THAT IS PRESENTLY AUTHORIZED TO FIELD MEDICAL UNITS.

APPROACH: (U) IDENTIFY PHYSICAL CHARACTERISTICS OF EXISTING ITEMS TO BE PROTECTED. DETERMINE SIMILARITIES AND THEN DESIGN A CONTAINER OR CONTAINERS WITH VARIOUS INSERTS TO PROTECT DURING HANDLING, SHIPPING AND STORAGE.

PROGRESS: (U) 8010-8109.- FOURTEEN ITEMS HAVE BEEN IDENTIFIED AS NEEDING IMMEDIATE PACKAGING. THESE HAVE BEEN PROCURED AND PACKAGING FOR EACH DESIGNED. DRAWINGS HAVE BEEN MADE FOR 10 ITEMS AND CONTAINER FABRICATION INITIATED. CONTAINER FABRICATIN COMPLETE. WRITING DTI PROTOCOLS. EXAMINING ALTERNATIVES TO FOAM PADDING.

* Available to contractors upon originators approval

PROCESSING DATE: 09 DEC 81

DD FORM 1 MAY 68 1498M DTIC FORMAT 850

DETAIL SHEET

TITLE: (U) Protective Containers, Field, Medical Devices

FUNDING HISTORY: PY - 60K; CY - 111K; BY - 65K

PROBLEM DEFINITION: A requirement exists for a family of strong, lightweight shipping containers for fragile medical equipment issued to field medical units.

IMPORTANCE: The protection of the sensitive medical equipment is essential during loading, transportation, and unloading when being deployed in field locations. This equipment, properly protected, must be available for immediate use in patient care. Unprotected, the equipment may be damaged or misaligned requiring extensive repair or recalibration.

APPROACH: Obtain medical equipment that requires packaging. These items will be tested to determine the degree of protection required. Using this information, a family of containers will be designed to protect these and other pieces of equipment. A study will also be made to increase the capacity of the existing medical equipment field chests.

ACHIEVEMENTS: Fourteen items of field medical equipment have been obtained. These have been identified as needing immediate packaging. Seven containers that will accommodate all 14 items have been designed and fabricated.

RELATIONSHIP TO CORE PROGRAM: In order to provide adequate patient care, it is essential to provide equipment in working order to units in the field. This containerization program will also reduce the time spent packaging equipment developed by this Laboratory.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) TREATMENT ;(U) PROCUREMENT ;(U) PATIENTS ;(U) AMBULANCES ;(U) TACTICAL WARFARE ;(U) FEASIBILITY STUDIES ;(U) EMERGENCIES ;(U) MEDICAL EVACUATION;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8a. DISTRIBUTION INSTR	8b. SPECIFIC DATA	9. LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	CONTRACTOR ACCESS YES [X] NO [ ]	A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIME:	62772A	3S162772A874	BA	232
b. CONTRIBUTING				
c. CONTRIBUTING				

11. TITLE (Precede with Security Classification Code):

(U) TACTICAL AMBULANCE ADAPTATION, FEASIBILITY STUDY OF

12. SCIENTIFIC AND TECHNOLOGICAL AREAS:

002400 BIOENGINEERING 009800 MED HOSP EQ

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
MAY 77	SEP 82	DA	C. IN-HOUSE

17. CONTRACT/GRANT:
a. DATES EFFECTIVE: EXPIRATION:
b. NUMBER:
c. TYPE: d. AMOUNT:
e. KIND OF AWARD: F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE	a. PROFESSIONAL MAN YRS	b. FUNDS (in Thousands)
FISCAL YEAR PRECEDING 1981	1.0	$ 84
FISCAL YEAR CURRENT 1982	0.2	$ 13

19. RESPONSIBLE DOD ORGANIZATION: 407838 2406
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20. PERFORMING ORGANIZATION: 407838 2406
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SOCIAL SECURITY ACCOUNT NUMBER:
ASSOCIATE INVESTIGATORS
NAME:
NAME:

22. GENERAL USE: 21A. B. C. D. E.

23. KEYWORDS (Precede EACH with Security Classification Code): (U) AMBULANCE ;(U) TACTICAL AMBULANCE;(U) EMERGENCY MEDICAL VEHICLE ;(U) MEDICAL TRANSPORT ;

24. TECHNICAL OBJECTIVE, 25. APPROACH, 26. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code):

OBJECTIVE:(U) TO CONDUCT A STUDY OF THE ARMY'S NEEDS IN TACTICAL AMBULANCES AND THEIR CAPABILITIES IN PREPARATION FOR THE NEXT MAJOR PROCUREMENT.

APPROACH: (U) INITIATE A STUDY PROGRAM TO IDENTIFY THE NUMBER AND TYPE OF VEHICLES NEEDED, THE REQUIRED MEDICAL CAPABILITIES OF EACH AND THE LOGISTICAL IMPLICATIONS. THE RESULTS OF THIS STUDY WILL BE A COMPREHENSIVE REQUIREMENTS DOCUMENT.

PROGRESS: (U) 8010 - 8109. A WEST GERMAN HARD MOUNTED LITTER RACK FOR THE M113 HAS BEEN RECOMMENDED FOR ADOPTION WITH SOME MINOR MODIFICATIONS THAT ARE CURRENTLY BEING DISCUSSED WITH THE MANUFACTURER. ALSO, A NUMBER OF M113 AMBULANCE EQUIPAGE SCHEMES HAVE BEEN EXPLORED WITH THE INFORMATION THUS GENERATED PASSED ON TO THE COMBAT DEVELOPER. WORK HAS ALSO BEEN PERFORMED ON THE PACKAGING OF A FUNCTIONAL MOBILE AID STATION IN A LARGER ARMORED, TRACKED VEHICLE WITH THE DEVELOPMENTAL FVS VEHICLE BEING USED AS A MODEL FOR THIS WORK.

*Available to contractors upon originator approval

PROCESSING DATE: 30 NOV 81

DD FORM 1 MAY 68 1498M DTIC FORMAT 850 PAGE 14

DETAIL SHEET

TITLE: (U) Tactical Ambulance Adaptation, Feasibility Study of

FUNDING HISTORY: PY - 51K; CY - 84K; BY - 13K

PROBLEM DEFINITION: To assist the Combat Developer in determining the level of medical treatment that can practically be provided in tactical ambulances by studying items of equipment and layout of tactical vehicles for compatibility.

IMPORTANCE: The "Division 86" study, currently going on, is leaning toward expansion of the level of medical treatment in the forward area including ambulance vehicles. In view of the decision that tactical ambulances will be adaptations of combat vehicles, it becomes important to know what equipment can logically be placed in those vehicles and how well the medical personnel function with it.

APPROACH: To procure specimen tactical vehicles and equip them as medical treatment/evacuation vehicles based on guidance from the Combat Developer and medical consultants. These trial configurations will then be evaluated for functional practicability and the results transmitted for use in "Division 86" or other studies.

ACHIEVEMENTS: A stabilized litter rack for the M113 ambulance has been procured and tested at Fort Benning. This item has been approved by all cognizant AMEDD agencies for adoption and has been recommended to USATACOM for procurement as a vehicle kit.

RELATIONSHIP TO CORE PROGRAM: Development of ambulance internal configuration comes under the mission of this research area to develop field medical treatment and evacuation equipment.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) FIELD CONDITIONS ;(U) COMMERCE ;(U) WORK ;(U) SOURCES ;(U) MEDICAL SERVICES ;(U) FIELD EQUIPMENT ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 AGENCY ACCESSION	2 DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0G2839	01 OCT 81	FHP24C

3 DATE PREV SUM RY	4 KIND OF SUMMARY	5 SUMMARY SEVY	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION STMT	8b SPECIFIC DATA: CONTRACTOR ACCESS YES / NO	9 LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	YES	A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a PRIMARY	62772A	3S162772A874	BA	235
b CONTRIBUTING				
c CONTRIBUTING				

11 TITLE (Precede with Security Classification Code) *

(U) APPARATUS, X-RAY, DENTAL, FIELD

12 SCIENTIFIC AND TECHNOLOGICAL AREAS *

002400 BIOENGINEERING 009800 MED HOSP EQ

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY	16 PERFORMANCE METHOD
MAY 80	JAN 82	DA	C. IN-HOUSE

17 CONTRACT/GRANT *

a DATES EFFECTIVE EXPIRATION

b NUMBER *

c TYPE d AMOUNT

e KIND OF AWARD F. CUM/TOT: $ 0

18 RESOURCES ESTIMATE

		a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
FISCAL YEAR PRECEDING	1981	0.3	$ 36
FISCAL YEAR CURRENT	1982	0.4	$ 37

19 RESPONSIBLE DOD ORGANIZATION 407838 2406

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ASSOCIATE INVESTIGATORS

NAME

NAME

21 GENERAL USE

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code) (U) X-RAY ;(U) FIELD MEDICINE ;(U) FIELD EQUIPMENT ;(U) DENTAL X-RAY;(U) LOW DOSE X-RAY ;(U) DENTAL APPARATUS

23 TECHNICAL OBJECTIVE ; 24 APPROACH 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO OBTAIN A LOW CAPACITY RADIOGRAPHIC APPARATUS SUITABLE TO MEET THE REQUIREMENTS OF PORTABLE FIELD DENTAL UNITS.

APPROACH: (U) EVALUATE COMMERCIAL SOURCES FOR A FUNCTIONAL DEVICE THAT CAN BE ADAPTED TO MEET THE REQUIREMENTS.

PROGRESS: (U) 8009 - 8109. SEVERAL COMMERCIAL DENTAL X-RAY UNITS WERE OBTAINED AND SUBJECTED BY RADIATION LEAKAGE EVALUATION BY AEHA. ONE UNIT WAS NOT RECOMMENDED FOR FURTHER EVALUATION BY AMERD. DESIGN AND FABRICATION OF FIELD CONTAINERS WERE INITIATED DURING 4TH QUARTER 81.

* Available to contractors upon originators approval

PROCESSING DATE: 08 JAN 82

DD FORM 1 MAY 68 1498M DTIC FORMAT 850 PAGE 50

DETAIL SHEET

TITLE: (U) Apparatus, X-Ray, Dental, Field

FUNDING HISTORY: PY - 7K; CY - 36K; BY - 37K

PROBLEM DEFINITION: New FDA regulations preclude use of previous X-ray units in field units, necessitating investigation of new X-ray units that will meet these standards.

IMPORTANCE: Current field dental TOE units do not have an authorized/certified X-ray unit.

APPROACH: Commercial sources were searched for devices that will meet the requirements.

ACHIEVEMENTS: Radiation leakage tests were completed. Modified DT I test was also completed. Single commercial prototype was subjected to OT I test.

RELATIONSHIP TO CORE PROGRAM: This program is directly related to the Laboratory's mission to develop field medical materiel.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) ARMY PERSONNEL ;(U) WORK ;(U) HOSPITALS ;(U) FIELD CONDITIONS ;(U) FEMALES ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 AGENCY ACCESSION	2 DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0G5856	01 OCT 81	FHP24C

3 DATE PREV SUM	4 KIND OF SUMMARY	5 SUMMARY SCTY	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION INSTR	8b SPECIFIC DATA	9 LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	[X] CONTRACTOR ACCESS YES [ ] NO	A. WORK UNIT

10 NO./CODES:*	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a PRIMARY	62772A	3S162772A874	BA	236
b CONTRIBUTING				
c CONTRIBUTING				

11 TITLE (Precede with Security Classification Code)*

(U) FIELD GURNEY

12 SCIENTIFIC AND TECHNOLOGICAL AREAS *

009800 MED HOSP EQ 002400 BIOENGINEERING

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY	16 PERFORMANCE METHOD
SEP 80	JUN 84	DA	C. IN-HOUSE

17 CONTRACT/GRANT

a DATES EFFECTIVE — EXPIRATION

b NUMBER *

c TYPE — d AMOUNT

e KIND OF AWARD — F. CUM/TOT: $ 0

18 RESOURCES ESTIMATE		a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	0.6	$ 56
	CURRENT 1982	0.8	$ 68

19 RESPONSIBLE DOD ORGANIZATION — 407838 2406

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NAME CONWAY, W.H.

NAME

21 GENERAL USE

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code)

(U) MOBILE LITTER ;(U) LITTER CARRIER ;(U) WHEELED LITTER ;(U) STANDARD ARMY LITTER ;

23 TECHNICAL OBJECTIVE, 24 APPROACH, 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO DEVELOP A DEVICE THAT ENABLES A STANDARD ARMY LITTER TO BE CONVERTED INTO A WHEELED "GURNEY" TYPE OF PATIENT CONVEYANCE THAT CAN BE MOVED BY ONE OR, AT WORST, TWO LITTER BEARERS OVER FIELD TERRAIN. THE PURPOSE IS TO REDUCE THE NUMBER OF PERSONNEL REQUIRED IN FIELD HOSPITALS TO MOVE PATIENTS AND TO FACILITATE THE USE OF FEMALE SOLDIERS IN THE ROLE OF LITTER BEARER.

APPROACH: (U) PROCURE AND EVALUATE SPECIMENS OF FOREIGN EQUIPMENT THAT ADDRESSES THIS NEED AND IS KNOWN TO EXIST. FAILING THAT, A NEW DEVELOPMENT EFFORT WILL BE UNDERTAKEN.

PROGRESS: (U) 8010 - 8109. A WEST GERMAN LITTER CART HAS BEEN PROCURED AND EVALUATED FROM AN ENGINEERING STANDPOINT. THIS UNIT SHOWS PROMISE WITH INCORPORATION OF A FEW MODIFICATION AND THESE ARE BEING MADE ON AN EXPERIMENTAL BASIS. ALSO, A TEST BED FOR EVALUATING VARIOUS TYPES OF WHEELS ON TERRAIN SAMPLES AND A NUMBER OF TESTS HAVE BEEN CONDUCTED USING FEMALE OPERATORS OF NEAR-50TH PERCENTILE PHYSICAL STATURE.

*Available to contractors upon originators approval

PROCESSING DATE: 06 JAN 82

DD FORM 1 MAY 68 1498M DTIC FORMAT 850 PAGE 81

DETAIL SHEET

TITLE: (U) Field Gurney

FUNDING HISTORY: PY - 0; CY - 56K; BY - 68K

PROBLEM DEFINITION: In a mass-casualty situation, the need to move litter patients between the dispersed elements of a field hospital or clearing station would put a severe strain on the available manpower. A conveyance is needed to reduce the number of litter bearers required per carry from four to not more than two, and preferably one.

IMPORTANCE: The intense combat predicted by current European scenarios indicates that mass-casualty situations at field hospitals will be a more common occurrence. This fact, coupled with increased use of female soldiers in roles such as litter bearer, makes it necessary that manpower required for the movement of litter patients in and around field treatment facilities be reduced to a minimum and that the physical demands made on litter bearers be lessened.

APPROACH: To develop a wheeled litter carrier, after the fashion of a hospital Gurney, that is capable of being operated over moderately rough terrain by one, or not more than two, litter bearers of unremarkable physical stature.

ACHIEVEMENTS: A test bed was constructed to evaluate various wheel configurations operating over various types of terrain. A West German wheeled litter carrier is being procured for evaluation and shows promise of meeting the requirements.

RELATIONSHIP TO CORE PROGRAM: This task is consistent with the Laboratory's mission of developing field medical equipment.

PREVENTION OF MILITARY DISEASE HAZARDS

RETRIEVAL TERMS ASSIGNED BY DTIC (U) BACTERIA ;(U) ADVERSE CONDITIONS;(U) WORK ;(U) STORAGE ;(U) PATHOGENIC MICROORGANISMS ;(U) INSECTS ;(U) FIELD TESTS ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION: DA088244	2. DATE OF SUMMARY: 01 OCT 81		REPORT CONTROL SYMBOL: FHP24C
3. DATE REV SUM RY: 01 OCT 80	4. KIND OF SUMMARY: D. CHANGE	5. SUMMARY SCTY: U	6. WORK SECURITY: U	7. REGRADING:	8a. DISTRIBUTION MSTY: NL	8b. SPECIFIC DATA: ☒ CONTRACTOR ACCESS YES ☐ NO	9. LEVEL OF SUM: A. WORK UNIT
10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
a. PRIMARY	62770A	3M162770A871		CB	262		
b. CONTRIBUTING							
c. CONTRIBUTING							

11. TITLE (Precede with Security Classification Code):

(U) INTEGRATED PEST MANAGEMENT - BLACK FLIES

12. SCIENTIFIC AND TECHNOLOGICAL AREAS:

005900 ENVIR BIOLOGY 002600 BIOLOGY

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
OCT 78	SEP 83	DA	C. IN-HOUSE

17. CONTRACT/GRANT:
a. DATES EFFECTIVE: EXPIRATION:
b. NUMBER:
c. TYPE: d. AMOUNT:
e. KIND OF AWARD: F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE		a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	2.0	$ 92
	CURRENT 1982	1.1	$ 40

19. RESPONSIBLE DOD ORGANIZATION: 407838 2406
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SOCIAL SECURITY ACCOUNT NUMBER:

ASSOCIATE INVESTIGATORS
NAME: NELSON, J H
NAME:

c. GENERAL USE: 21A. B. C. D. E.

22. KEYWORDS (Precede EACH with Security Classification Code):

(U) INTEGRATED PEST MANAGEMENT ;(U) IPM ;(U) BIOLOGICAL CONTROL;

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code):

OBJECTIVE:(U) TO DEVELOP A METHOD OF LONG-TERM SUPPRESSION OF IMMATURE STAGES OF BLACK FLIES WITHOUT ADVERSE EFFECT ON THE ENVIRONMENT. CURRENTLY, BLACK FLIES SEASONALLY RESTRICT USE OF VAST MILITARY TRAINING AREAS AT SEVERAL CONUS INSTALLATIONS. OVERSEAS, THEY ARE THE PRIMARY VECTOR OF ONCHOCERIASIS OR RIVER BLINDNESS, A DISEASE OF MILITARY IMPORTANCE IN PARTS OF AFRICA, CENTRAL AND SOUTH AMERICA. EFFECTIVE VECTOR CONTROL STRATEGIES WILL PERMIT INCREASED MILITARY TRAINING AT THE AFFECTED INSTALLATIONS AND WILL REDUCE THE THREAT OF NON COMBAT CASUALTIES DUE TO ONCHOCERIASIS.

APPROACH: (U) GROWTH REGULATOR HORMONES OR SYNTHETIC CHEMICAL ANALOGUES WILL BE APPLIED IN THE AQUATIC HABITAT IN LABORATORY AND FIELD EVALUATIONS IN SUCH A MANNER TO ATTACH TO SPECIFIC SUBSTRATES AND WITH SLOW RELEASE ACTION PROVIDE LONG LASTING CONTROL. ATTENTION WILL ALSO BE DIRECTED TO THE USE OF BIOLOGICAL CONTROL AGNETS INCLUDING PATHOGENIC PROTOZOA, BACTERIA, AND MICROSPORIDIA. INSECT PATHOGENS ON HAND WILL BE EVALUATED AGAINST BLACK FLIES. FURTHER, NATURALLY OCCURRING BLACK FLY PATHOGENS WILL BE COLLECTED AND EVALUATED. LABORATORY AND FIELD TESTING IS REQUIRED TO DEVELOP METHODS FOR MANIPULATION, STORAGE, AND APPLICATION OF THESE AGENTS.

PROGRESS: (U) 8010 - 8109. SUCCESSFUL FIELD TRIALS FOR CONTROLLING BLACK FLIES IN THE PRESENCE OF EXTENSIVE AQUATIC VEGETATIVE GROWTH WERE COMPLETED DURING THE LAST QTR OF 1980 AND 2ND QTR 1982 USING BACILLUS THURINGIENSIS ISRAELENSIS (BTI). RESULTS CLEARLY DEMONSTRATED THAT AQUATIC VEGETATIVE GROWTH HAD LITTLE INFLUENCE ON THE LARVICIDAL CAPABILITY OF BTI. THE TEST DATA RESULTS REVEALED THAT 80 PERCENT PLUS MORTALITY CAN BE ACHIEVED OVER A 1/4 MILE LENGTH OF STREAM, FOR A WEEK OR LONGER. HAAP, TN, PEST CONTROL PERSONNEL ARE CURRENTLY APPLYING BTI TO THE FIVE INFESTED STREAMS AT 3.00 PPM WT/VOL AT 2 WEEK INTERVALS. TO DATE, A 75 TO 80 PERCENT REDUCTION HAS BEEN MAINTAINED IN THE LARVAL POPULATIONS IN THESE STREAMS. LABORATORY BIOASSAY TESTS WITH ABATE 200E (TEMEPHOS) WITH BLACK FLY LARVAE HAVE SHOWN (AS WITH BTI) THAT THE LEVEL OF LARVAL MORTALITY; I.E., SUSCEPTIBILITY, IS DOSE-TIME DEPENDENT.

*Available to contractors upon originators approval

PROCESSING DATE: 30 NOV 81

DD FORM 1 MAY 80 1498M DTIC FORMAT 850 PAGE 17

DETAIL SHEET

TITLE: (U) Integrated Pest Management - Blackflies

FUNDING HISTORY: PY - 98K; CY - 92K; BY - 40K

PROBLEM DEFINITION: To develop a program of long-term suppression of blackfly populations without adverse effects on the environment.

IMPORTANCE: Blackflies are major vectors of onchoceriasis and rank high as military nuisance pests. In areas where onchoceriasis occurs, blindness due to this filarial infection is epidemic. In areas where large populations of blackflies occur, training and marshalling areas cannot be used in presence of these pests. There currently is no effective means for control of these insects.

APPROACH: Growth regulator hormones or synthetic chemical analogues and chemical pesticides will be applied in the aquatic habitat in laboratory and field evaluations in such a manner to attach to specific substrates and with slow-release action provide long lasting control. Attention will also be directed to the use of biological control agents including pathogenic protozoa, bacteria, and microsporidia. Inspect pathogens on hand will be evaluated against blackflies. Further, naturally occurring blackfly pathogens will be collected and evaluated. Laboratory and field testing are to develop methods for manipulation, storage, and application of these agents.

ACHIEVEMENTS: Several successful field trials using a commercial agent, Bacillus thuringiensis israelensis (Bti), were conducted at Holston Army Ammunition Plant, Kingsport, TN. Trials demonstrated that Bti could be effectively used over significant lengths of a stream with duration of control of 1 week or more. Control effectiveness was found not to be disrupted by stream flow characteristics or dense vegetation. Preliminary studies with nontarget organisms indicate this control strategy will not adversely affect stream fauna. Other studies have shown that larval mortality is dose-time dependant.

RELATIONSHIP TO CORE PROGRAM: This project is the first systematic approach to providing a vector control program for management of a medically important insect. Project is in keeping with mission for research in applied military vector control.

MANUSCRIPTS: The Evaluation of Bacillus thuringiensis var. israelensis against Simulium Vittatum (Diptera:Simuliidae) Larvae in their Natural Habitat I, Frommer, Dr. R. L., Hembree, S. C., Nelson, Dr. J. H., Remington, M. P., ARD, and Paul H. Gibbs, EPRD. For publication in Journal of Medical Entomology.

Distribution of Bacillus thuringiensis var. israelensis in Flowing Water I, Frommer, Dr. R. L., Hembree, S. C., Nelson, Dr. J. H., Remington, M. P., ARD, and P. H. Gibbs, EPRD. For publication in Journal of Medical Entomology.

The Distribution of Bacillus thuringiensis var. israelensis in Flowing Water with Extensive Aquatic Vegetative Growth. Frommer, Dr. Robert L., Nelson, Dr. James H., Remington, M. P., ARD, and P. H. Gibbs, EPRD. For publication in Mosquito News.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) CORROSION ;(U) DETERMINATION ;(U) ENGINEERING ;(U) HIGH RATE ;(U) REPAIR;(U) PARTS ;(U) PARTICLE SIZE ;(U) MAINTENANCE ;(U) LOGISTICS ;(U) MEAN ;(U) SPECIFICATIONS ;(U) WINGED INSECTS ;(U) *CULICIDAE ;(U) *PESTICIDES ;(U) DISPENSERS

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0A6296	01 OCT 81	FHP24C

3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8a. DISTRIBUTION INSTR	8b. SPECIFIC DATA: CONTRACTOR ACCESS YES [X] NO [ ]	9. LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL		A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62770A	3M162770A871	CB	264
c. CONTRIBUTING				
c. CONTRIBUTING				

11. TITLE (Precede with Security Classification Code):

(U) EVALUATION OF SKID MOUNTED AND SPECIAL PURPOSE PESTICIDE DISPERSAL EQUIPMENT

12. SCIENTIFIC AND TECHNOLOGICAL AREAS:

009800 MED HOSP EQ 002400 BIOENGINEERING

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY			16. PERFORMANCE METHOD
MAR 75	CONT	DA			C. IN-HOUSE

17. CONTRACT/GRANT:

a. DATES EFFECTIVE: EXPIRATION:
b. NUMBER:
c. TYPE: d. AMOUNT:
e. KIND OF AWARD: f. CUM/TOT: $ 0

18. RESOURCES ESTIMATE		a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	0.2	$ 20
	CURRENT 1982	0.4	$ 11

19. RESPONSIBLE DOD ORGANIZATION: 407838 2406

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NAME: THAYER, G.W.

21. GENERAL USE

21A. B. C. D. E.

22. KEYWORDS (Precede EACH with Security Classification Code): (U) INSECT CONTROL ;(U) PESTICIDE DISPERSAL ;(U) ENGINEER TESTS ;(U) ULTRA-LOW VOLUME (ULV) ;(U) SKID MOUNTED SPRAYER ;

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code):

OBJECTIVE:(U) TO DETERMINE THE DURABILITY OF COMMERCIALLY AVAILABLE ULTRA-LOW VOLUME (ULV) AND POWER PESTICIDE DISPERSAL EQUIPMENT BY COMPARATIVE TYPE ENGINEERING TESTS. UNITS WILL BE USED BY MILITARY MEDICAL AND ENGINEER PERSONNEL FOR CONTROLLING MOSQUITO AND OTHER FLYING INSECTS. RESULTS WILL PROVIDE THE USER AGENCIES WITH COMPARATIVE DURABILITY DATA FOR PURCHASE THROUGH MILITARY CHANNELS.

APPROACH: (U) TO DETERMINE THE OPERATIONAL CAPABILITIES OF SKID MOUNTED AND SPECIAL PURPOSE ULV PESTICIDE DISPERSAL EQUIPMENT BY QUANTITATIVE AND QUALITATIVE METHODS. MEASURABLE QUANTITATIVE PARAMETERS INCLUDE- PARTICLE SIZE DETERMINATION AND MAINTENANCE OF DESIRED PRESSURE AND FLOW RATE. GENERAL ENGINEERING DESIGN OBSERVATIONS WILL INCLUDE- CORROSIVE EFFECT OF PESTICIDE USED DURING TESTS, VERIFICATION OF MANUFACTURERS' CLAIM OF PERFORMANCE SPECIFICATIONS, GENERAL DURABILITY DEFINITIONS AS APPLIED TO MEAN TIME BETWEEN BREAKDOWN, MAINTENANCE TIME, GAS AND OIL CONSUMPTION AND DEFINITION OF HIGH MORTALITY REPAIR PARTS.

PROGRESS: (U) 8010 - 8109. EVALUATION OF MICRO-GEN MODELS CCG-1, M-16, AND S-4 COMPLETED. EVALUATION OF BALT MODEL E-10 COMPLETED. EVALUATION OF MICRON ULVA AND MINI ULVA IS IN PROGRESS. SKID MOUNTED POWER SPRAYER WILL BE EVALUATED DURING FY82.

*Available to contractors upon originator's approval

PROCESSING DATE: 08 JAN 82

DD FORM 1 MAY 68 1498M DTIC FORMAT 850 PAGE 4

DETAIL SHEET

TITLE: (U) Evaluation of Skid Mounted and Special Purpose Pesticide Dispersal Equipment

FUNDING HISTORY: PY - 64K; CY - 20K; BY - 11K

PROBLEM DEFINITION: Continuous evaluation of the basic engineering design and durability and operational effectiveness of commercial pest control equipment.

IMPORTANCE: Yearly, new, and improved commercial items are presented to DOD as potential standard items. Most of these are suitable for DOD use. Others are unfit and should not be procured. Centralized, uniform testing of these items, on a request basis, is essential to maintain state-of-the-art technology in pest control and to keep from wasting tax dollars on unacceptable equipment.

APPROACH: At the request of other DOD agencies and developing needs of military vector control programs, conduct extensive engineering and operational evaluations of designated items. These evaluations will include items such as specification design, quality assurance testings as required by specification and procurement, and individual item evaluation.

ACHIEVEMENTS: Evaluations of the Micro-Gen CCG-1, M-16, and Bolt E-10 resulted in information that was used to justify bringing these units of equipment into the federal supply system. Two portable ULV sprayers, Micron ULVA and Mini ULVA, were evaluated for durability and acceptance. Problems encountered related to unacceptable pesticide exposure by operating personnel and a great amount of variation in droplet sizes produced by these sprayers.

RELATIONSHIP TO CORE PROGRAM: Project involves continuous evaluation of commercially available pesticide dispersal equipment. Project provides a technology base for pest control equipment evaluation and development.

RETRIEVAL TERMS ASSIGNED BY DTIC (U) DROPS ;(U) MILITARY EQUIPMENT;(U) MILITARY FACILITIES ;(U) SIZES(DIMENSIONS) ;(U) UNITED STATES ;(U) OPERATION ;(U) *INSECT CONTROL ;(U) DISPERSING ;(U) *PESTICIDES ;(U) FIELD EQUIPMENT ;(U) KITS ;(U) MEASUREMENT ;(U) OVERSEAS ;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 AGENCY ACCESSION	2 DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0B6058	01 OCT 81	FHP24C

3 DATE PREV SUM RY	4 KIND OF SUMMARY	5 SUMMARY SCTY	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION INSTR	8b SPECIFIC DATA: CONTRACTOR ACCESS	9 LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	[X] YES [ ] NO	A. WORK UNIT

10 NO./CODES:*	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a PRIMARY	62770A	3M162770A871	CB	265
b CONTRIBUTING				
c CONTRIBUTING				

11 TITLE (Precede with Security Classification Code)

(U) PESTICIDE DISPERSAL EVALUATION SET

12 SCIENTIFIC AND TECHNOLOGICAL AREAS

009800 MED HOSP EQ 002400 BIOENGINEERING

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY	16 PERFORMANCE METHOD
APR 75	SEP 85	DA	C. IN-HOUSE

17 CONTRACT/GRANT

a DATES EFFECTIVE EXPIRATION

b NUMBER

c TYPE c AMOUNT

d KIND OF AWARD F. CUM/TOT: $ 0

18 RESOURCES ESTIMATE

		a PROFESSIONAL MAN YRS	b FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	0.4	$ 34
	CURRENT 1982	0.3	$ 11

19 RESPONSIBLE DOD ORGANIZATION 407838 2406

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NAME NELSON, J H

NAME ANDERSON, L.M.

21 GENERAL USE

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code) (U) PESTICIDE DISPERSAL ;(U) DROPLET SIZE;(U) INSECT CONTROL ;(U) EPA REQUIREMENTS ;

23 TECHNICAL OBJECTIVE; 24 APPROACH 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO DEVELOP A PESTICIDE FIELD EVALUATION SET CAPABLE OF MEASURING ULV DROPLET SIZE AND TOTAL PESTICIDE AMOUNTS APPLIED BY MILITARY DISPERSAL EQUIPMENT UTILIZED IN INSECT CONTROL OPERATIONS AT MILITARY INSTALLATIONS IN CONUS AND OVERSEAS.

APPROACH: (U) REVIEW COMMERCIAL OR MILITARY SOURCES AND IF SEARCH IS UNSUCCESSFUL, FABRICATE NEW EQUIPMENT AND FIELD EVALUATE FOR EFFICACY OF DESIGN.

PROGRESS: (U) 8010 - 8109. A COMPARISON OF THE PMS OPTICAL IMAGING DROPLET SPECTROMETER (OIDS) AND THE KLD ASSOCIATES HOT WIRE DROPLET COUNTER AND MEASURING DEVICE WAS COMPLETED. UNITS HAD SIMILAR MEASUREMENTS WHEN MEASURING WATER DROPLETS, BUT VARYING DATA WHEN MEASURING MINERAL OIL DROPLETS. A DSATT CONTRACT IS PLANNED FOR FURTHER EXPERIMENTAL TEST AND EVALUATION FOR THE KLD ASSOCIATE'S EQUIPMENT.

*Available to contractors upon originators approval

PROCESSING DATE: 31 MAY 82

DD FORM 1 MAY 68 1498M DTIC FORMAT 850 PAGE 6

DETAIL SHEET

TITLE: (U) Pesticide Dispersal Evaluation Set

FUNDING HISTORY: PY - 18K; CY - 34K; BY - 11K

PROBLEM DEFINITION: The development of instrumentation that can accurately measure droplet size distribution in pesticide aerosols, thus providing precise calibration for pesticide dispersal units.

IMPORTANCE: Accurate calibration of dispersal equipment is essential for the effective and economical usage of ULV pesticide formulations to provide protection for the soldier from disease vectors and pest arthropods. The dissemination of droplets that are too large for effective control are capable of adverse environmental effects.

APPROACH: An optical imaging aerosol droplet sizing spectrometer has been secured and has been calibrated. A ground aspirator which produces a constant speed airflow past the sampling region of the spectrometer has been secured. The aspirator will provide isokinetic conditions at the sampling region and will also enable the data processing system of the spectrometer to provide aerosol concentration information. Various nonvolatile droplet aerosols will be dispersed, and information on their size distribution and propagation will be gathered.

Additional experiments are planned in which the results of the aerosol spectrometer are compared with other droplet sizing techniques (e.g., slidewave, settling, hot wire sampler).

ACHIEVEMENTS: The PMS optical imaging droplet spectrometer (OIDS) was installed in the Laboratory. A series of tests were conducted to test correlation of OIDS with current slidewave methodology. After refinement by the manufacturer, an initial correlation coefficient was determined. The OIDS was also successfully operated using field power sources, thus demonstrating a potential for field utilization. A comparison of a hot-wire droplet measuring device and the OIDS was completed. Results indicated close correlations with water, but not with mineral oil. A contract with KLD Associates is planned which will look at some of the phenomenon associated with measuring droplets using a hot wire. Calibration curves will be established for insecticides, and another comparison with the OIDS will be made.

RELATIONSHIP TO CORE PROGRAM: An item of medical surveillance equipment which will enable the TOE entomology service units to ensure application of proper droplet sizes by their ULV dispersal equipment. Program is related to the core program in the areas of medical equipment development and integrated pest management systems.

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) INSECT CONTROL ;(U) CULICIDAE ;(U) CHEMISTRY ;(U) ARMY ;(U) WORK ;(U) PEST CONTROL;(U) OBSERVATION ;(U) MILITARY FACILITIES ;(U) INTEGRATED SYSTEMS;

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1 AGENCY ACCESSION	2 DATE OF SUMMARY	REPORT CONTROL SYMBOL
DA0G0649	01 OCT 81	FHP24C

3 DATE PREV SUM	4 KIND OF SUMMARY	5 SUMMARY SCTY	6 WORK SECURITY	7 REGRADING	8a DISTRIBUTION INSTR	8b SPECIFIC DATA	9 LEVEL OF SUM
01 OCT 80	D. CHANGE	U	U		NL	CONTRACTOR ACCESS YES [X] NO [ ]	A. WORK UNIT

10 NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a PRIMARY	62770A	3M162770A871	CB	266
b CONTRIBUTING				
c CONTRIBUTING				

11 TITLE (Precede with Security Classification Code)

(U) INTEGRATED PEST MANAGEMENT - MOSQUITOES

12 SCIENTIFIC AND TECHNOLOGICAL AREAS

005900 ENVIR BIOLOGY 002600 BIOLOGY

13 START DATE	14 ESTIMATED COMPLETION DATE	15 FUNDING AGENCY	16 PERFORMANCE METHOD
OCT 79	SEP 85	DA	C. IN-HOUSE

17 a CONTRACT/GRANT

b DATES EFFECTIVE — EXPIRATION

c NUMBER

d TYPE — e AMOUNT

f KIND OF AWARD — F. CUM/TOT: $ 0

18 RESOURCES ESTIMATE		a PROFESSIONAL MAN YRS	b FUNDS (in Thousands)
FISCAL YEAR	PRECEDING 1981	3.3	$ 157
	CURRENT 1982	1.8	$ 88

19 a RESPONSIBLE DOD ORGANIZATION 407838 2406

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NAME: HEMBREE, S.C.

NAME: NELSON, J.H.

21 GENERAL USE

21A. B. C. D. E.

22 KEYWORDS (Precede EACH with Security Classification Code)

(U) INTEGRATED PEST MANAGEMENT ;(U) IPM ;(U) BIOLOGICAL CONTROL;(U) MOSQUITO CONTROL ;

23 TECHNICAL OBJECTIVE, 24 APPROACH, 25 PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) TO DEVELOP METHODS FOR MOSQUITO CONTROL WHICH INTEGRATE PHYSICAL, CHEMICAL, AND BIOLOGICAL CONTROL METHODS, AS APPROPRIATE TO THE TARGET, SO AS TO MAINTAIN EFFECTIVE CONTROL ECONOMICALLY WITHOUT UNDUE DAMAGE TO THE ENVIRONMENT. TO PROVIDE BASELINE LABORATORY DATA AND INFORMATION ON THE EFFICACY OF VARIOUS INSECTICIDES TO MOSQUITO LARVAE FROM WHICH FIELD APPLICATION RATES AND METHODS WILL BE DEVELOPED. EXPERIMENTAL FIELD TRIAL RESULTS WILL THEN BE INCORPORATED INTO IN-PLACE VECTOR CONTROL PROCEDURES USED BY PERSONNEL IN ARMY PREVENTIVE MEDICINE TOE UNITS.

APPROACH: (U) THE MOSQUITO PROBLEMS AT A US ARMY INSTALLATION WILL BE DEFINED USING PREVIOUSLY ACCUMULATED DATA AND ON-SITE OBSERVATIONS. PROPOSED STRATEGIES FOR CONTROL OF THE PROBLEMS WILL BE DEVELOPED. THESE STRATEGIES WILL INTEGRATE PHYSICAL, CHEMICAL AND BIOLOGICAL METHODS AS APPROPRIATE TO THE PROBLEMS AND AS APPROPRIATE TO PROJECTED RESOURCES FOR PEST CONTROL. THE PROPOSED STRATEGIES WILL BE IMPLEMENTED ON-SITE TO TEST THE INTEGRATED PEST MANAGEMENT CONCEPT AS IT APPLIES TO MOSQUITOES. CONVENTIONAL PEST MANAGEMENT METHODS WILL BE USED AS A BACK-UP, IF THE PROPOSED STRATEGIES PROVE INEFFECTIVE.

PROGRESS: (U) 8010 - 8109. SETTLING STUDIES WITH BTI HAVE SHOWN THAT THE RATE OF PRECIPITATION IS DEPENDENT ON THE LEVEL OF SUSPENDED PARTICLES PRESENT. FIELD TRIALS, USING DOSAGES RECOMMENDED ON THE MANUFACTURERS LABELS, RESULTED IN 93 PERCENT PLUS LARVAL MORTALITY. THE TEST DATA SUGGEST THAT THESE DOSAGES ARE RELIABLE IN PRODUCING HIGH MORTALITY. PARALLEL BIOASSAYS WITH BTI AND A DEVELOPMENTAL GROWTH INHIBITOR (IGR) REVEALED THAT THIS COMBINATION WAS SLIGHTLY MORE THAN ADDITIVE IN TERMS OF LARVAL MORTALITY.

*Available to contractors upon originators approval

PROCESSING DATE: 28 FEB 82

DD FORM 1 MAY 80 1498M DTIC FORMAT 850 PAGE 23

DETAIL SHEET

TITLE: (U) Integrated Pest Management - Mosquitoes

FUNDING HISTORY: PY - 0; CY - 157K; BY - 88K

PROBLEM DEFINITION: Rapid advances are being made in insect pest management technology in the civilian sector. Among those not yet fully capitalized on by military pest management are ultra-low volume pesticide dispersal technology, controlled release and microencapsulation formulations, use of hormone analogues, and the impending availability of effective, economical biological control agents for mosquitoes and blackflies. While evaluation and assimilation of some of this technology by the Army is under way, a context is needed in which to tie together conventional and developing technology into an integrated pest management system for use by the military to control mosquitoes efficiently, economically, and with minimal environmental insult.

IMPORTANCE: Vector control is the only way to protect the American fighting man from many vector-borne diseases. Military medical history demonstrates that protection of troops from vector-borne diseases may be vital to the outcome of armed conflict in many parts of the world. Therefore, it is of critical importance that insect pest/vector control technology in the military be developed and maintained at the highest state-of-the-art. The requirement that insect pest management be done with minimal environmental insult in CONUS and in host countries where host-country agreements so specify focuses special attention on hormone analogues and candidate biological control agents.

APPROACH: Field study areas will be identified at which developing mosquito control technology can be evaluated for suitability for use by the Army. Of immediate interest are hormone analogues and biological control agents nearing commercial availability.

ACHIEVEMENTS: Several field studies utilizing three formulations of the insect pathogen Bacillus thuringiensis var. israelensis were conducted. All were extremely efficient in effecting mortality of the target species.

RELATIONSHIP TO CORE PROGRAM: This project is a systematic approach to providing a vector control program for management of mosquitoes. Project is in keeping with mission for research in applied military vector control.

MANUSCRIPT: Simulated Field Studies with Four Formulations of Bacillus thuringiensis var. israelensis Against Mosquitoes: Residual Activity and Effect of Soil Constituents, Van Essen, Frank W., and Stephen C. Hembree. For publication in Mosquito News.

HEALTH HAZARDS OF MILITARY MATERIEL

UNCLASSIFIED

RETRIEVAL TERMS ASSIGNED BY DTIC (U) CARBON;(U) CELLS ;(U) CHEMICALS ;(U) FIELD CONDITIONS ;(U) FILTERS ;(U) FLUIDIZED BED PROCESSES ;(U) HOSPITALS ;(U) INORGANIC CHEMISTRY ;(U) ION EXCHANGE;(U) MEASUREMENT ;(U) MILITARY FACILITIES ;(U) OPERATION ;(U) PRODUCTION ;(U)

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY

1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
DAOG6778	01 OCT 81	FHP24C

3. DATE PREV. SUM.	4. KIND OF SUMMARY	5. SUMMARY SCTY.	6. WORK SECURITY	7. REGRADING	8a. DISTRIBUTION INSTR.	8b. SPECIFIC DATA: CONTRACTOR ACCESS YES / NO	9. LEVEL OF SUM
01 MAR 81	D. CHANGE	U	U		NL	YES	A. WORK UNIT

10. NO./CODES: *	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62777A	3E162777A878	CA	241
b. CONTRIB. ING				
c. CONTRIB. ING				

11. TITLE (Precede with Security Classification Code)

(U) FIELD PROVISION OF NONPYROGENIC WATER

12. SCIENTIFIC AND TECHNOLOGICAL AREAS *

007800 HYG SANITATION 010100 MICROBIOLOGY 008300 INORG CH

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD
MAR 81	SEP 82	DA	C. IN-HOUSE

17. CONTRACT/GRANT

a. DATES EFFECTIVE — EXPIRATION

b. NUMBER

c. TYPE — d. AMOUNT

e. KIND OF AWARD — F. CUM/TOT: $ 0

18. RESOURCES ESTIMATE		a. PROFESSIONAL MAN YRS	b. FUNDS (In Thousands)
FISCAL YEAR	PRECEDING 1981	0.1	$ 24
	CURRENT 1982	1.7	$ 20

19. RESPONSIBLE DOD ORGANIZATION 407838 2406

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ASSOCIATE INVESTIGATORS

NAME

NAME

21. GENERAL USE

21A. B. C. D. E.

22. KEYWORDS (Precede EACH with Security Classification Code)

(U) PYROGEN FREE WATER;(U) FIELD PRODUCTION ;(U) ROWPU

(U) INORGANIC CHEMISTRY ;

23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code)

OBJECTIVE:(U) THE OBJECTIVE IS TO ASCERTAIN THE FEASIBILITY OF CURRENT OFF-THE-WALL TECHNOLOGY FOR USE IN THE PRODUCTION OF PYROGEN-FREE WATER. THE FIELD PRODUCTION OF PYROGEN FREE WATER WOULD ELIMINATE THE LOGISTICAL PROBLEM OF SUPPLY TO FIELD HOSPITALS DURING COMBAT OPERATIONS. THE INFLUENT FOR A PYROGEN-FREE WATER UNIT WOULD BE COMPRISED OF THE EFFLUENT FROM THE ROWPU AT A WATER POINT.

APPROACH: (U) THE TREATMENT TRAIN WILL CONSIST OF A ROUGHING FILTER, REVERSE OSMOSIS UNIT, OZONALYSIS UNIT, FLUIDIZED BED CARBON FILTER, ION EXCHANGE UNIT, PYROGEN FILTER, AND 0.22 UM FILTER. PRODUCT WATER WILL BE EVALUATED FOR PYROGENS (LAL), CELLULAR TOXICITY (HELA) AND ANALYTICAL MEASUREMENTS OF CHEMICALS PROPOSED BY AAMI STANDARDS.

PROGRESS: (U) 8108 - 8109. NINETY-SEVEN PERCENT OF THE FINDING HAS BEEN OBLIGATED. ALL ITEMS OF THE TREATMENT TRAIN HAVE BEEN PURCHASED WITH ONE ITEM BACKORDERED FROM THE MILLIPORE CORP. SPACE HAS BEEN ALLOCATED AND STANDS BUILT IN BLDG. 1054. PARTS OF THE TREATMENT TRAIN HAVE BEEN CONSTRUCTED.

*Available to contractors upon originators approval

PROCESSING DATE: 30 NOV 81

DD FORM 1 MAY 68 1498M DTIC FORMAT 850 PAGE 69

DETAIL SHEET

TITLE: (U) Field Provision of Nonpyrogenic Water

FUNDING HISTORY: PY - 0; CY - 24K; BY - 20K

PROBLEM DEFINITION: To ascertain the feasibility of off-the-shelf technology for the production of nonpyrogenic water in a field environment.

IMPORTANCE: If generation of nonpyrogenic water can be accomplished in the field, it will alleviate a large logistical burden on the resupply of parental solutions.

APPROACH: A treatment train consisting of turbidity filter, reverse osmosis, ozonalysis, fluidized carbon bed, ion exchange, pyrogen filter and a 0.22 um filter will be evaluated.

ACHIEVEMENTS: The above materials have been received with the exception of the reverse osmosis unit which was back-ordered.

RELATIONSHIP TO CORE PROGRAM: This research is under the Director of Occupational Safety and Health and the Program Area Manager for Field Water and Sanitation. The research relates directly to the field soldier.

DISTRIBUTION LIST

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